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Tooling for Small Quantity Work

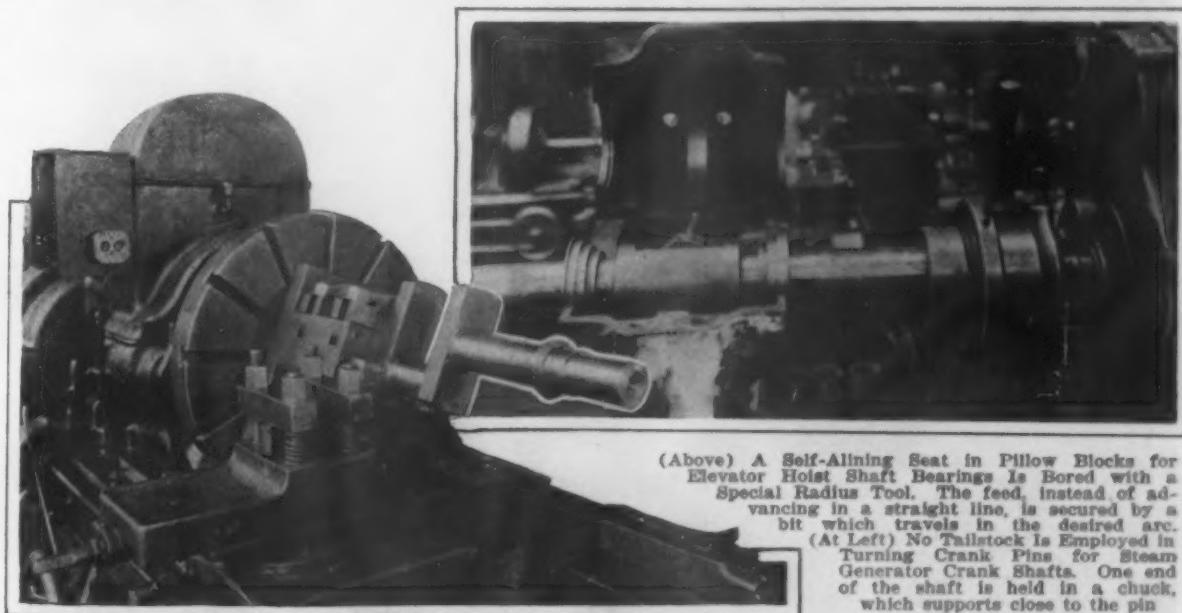
Jobs Not Calling for Bulk Production Put Through on
Semi-Production Basis—Savings Accomplished
by Grouping Operations

BY L. S. LOVE

To take care of a miscellany of work on any one of which jobs there is not sufficient output to warrant the use of a separate building for its production, one machine shop at the Schenectady works of the General Electric Co. is used for a variety of machine types. This shop handles such work as elevator hoisting motors, reciprocating steam generators, coal cutting machine motors, etc. In the manufacture of the various parts for these types of motors methods have been devised to reduce cost of machining, by as extensive tooling as the size of job may indicate would be

block is needed. These shafts are chucked in a special fixture, mounted on the face plate of the lathe, which surrounds one end entirely, gripping it, not only for driving, but also for rigid support. The fixture is made with a circular tongue to fit into a circular groove in the plate. In this manner the proper throw for the crank is assured, as the recess into which the shaft fits is eccentric with the tongue by an amount equal to the throw desired. Also the shaft is supported close to the point at which turning is done.

The operation of boring and facing of eccentric



(Above) A Self-Alining Seat in Pillow Blocks for Elevator Hoist Shaft Bearings Is Bored with a Special Radius Tool. The feed, instead of advancing in a straight line, is secured by a bit which travels in the desired arc.
(At Left) No Tailstock Is Employed in Turning Crank Pins for Steam Generator Crank Shafts. One end of the shaft is held in a chuck, which supports close to the pin.

warranted. The demands of this work have brought out a number of ingenious tool layouts and sets of fixtures.

The most interesting operation seen in the manufacture of elevator hoisting mechanisms is the radial boring of bearing-box seats in pillow blocks. This operation, somewhat similar to that employed on the bearings of turbine shafts, as described in a previous article, consists of a tool block mounted in a sleeve on the boring bar in such manner as to permit it to swivel at the center of the bar, causing the bit to describe the desired arc. The circular motion of the tool holder is controlled by a feed screw through the bar governed by a lever at the driven end.

No tailstock is used in turning the crank of the steam generator shaft, consequently no tail end throw-

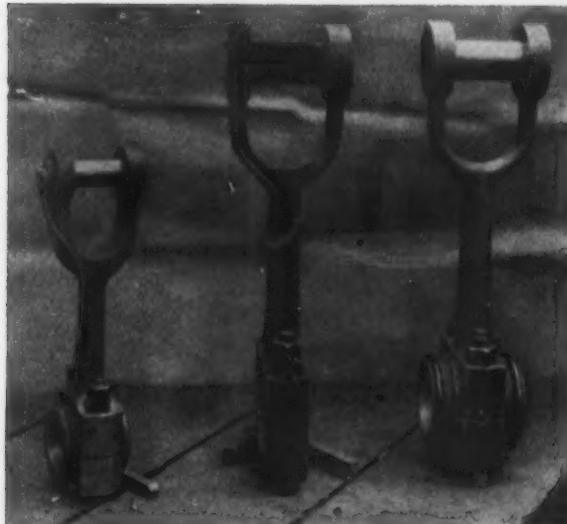
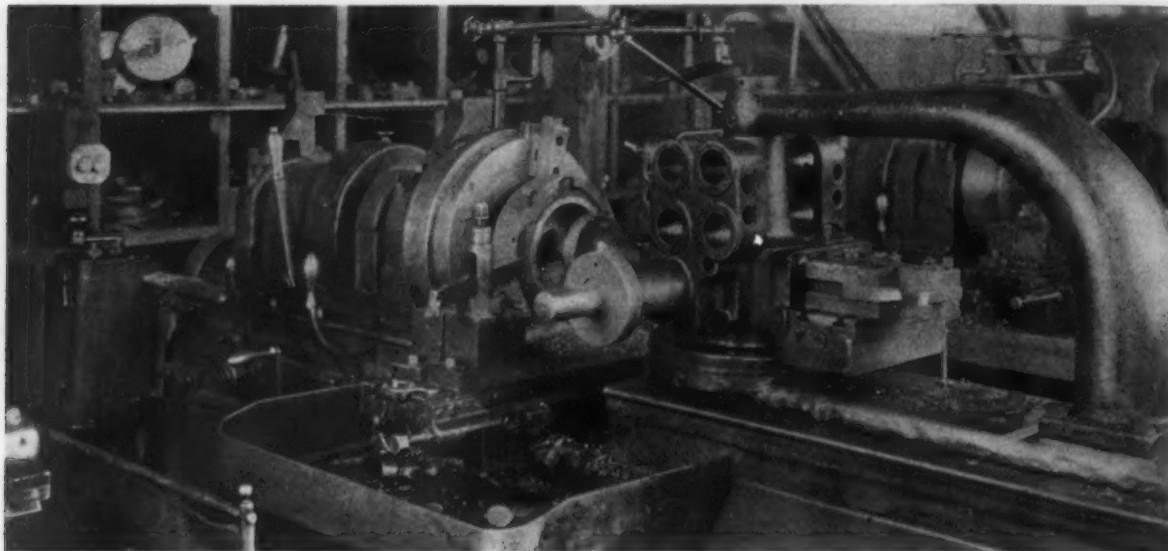
straps for this engine likewise has been much simplified. In this case use is made of a practice which seems to be rather common in this shop, namely, employment of the cross slide motion of a semi-automatic turret lathe to actuate an auxiliary slide mounted on the turret. The strap is mounted in a simple type of chuck needing only two set screws to hold it. After the rough and finish boring tools have completed their portions of the work, the facing tool holder is swung into place.

This holder has an auxiliary slide as a component part. It carries two tools, one for facing the front surface, the other for machining the back face. With a pusher mounted on the main cross slide, the auxiliary slide carrying these two tools is fed across the faces of the eccentric against a spring in the tool holder, which prevents gouging and also returns the tools to

starting position when the cut is completed, so that the turret control cam may withdraw the tools.

What, from a sectional view, would appear to be an oil channel drilled in a curved line is an interesting development in the oiling of steam generator connect-

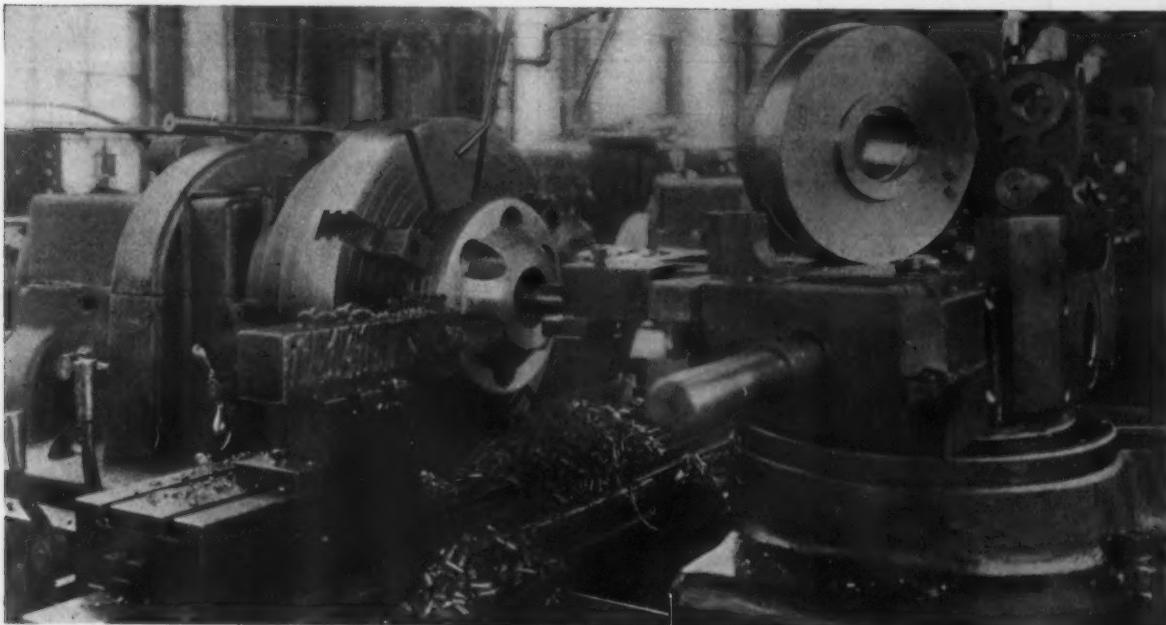
ing rods. It was formerly the practice to braze an oil tube into place from a hole in the crank box end to the cross head jaw end, so that oil would be carried freely to both pin bearings, passing through the tube, which paralleled the rod. This method was not entirely sat-

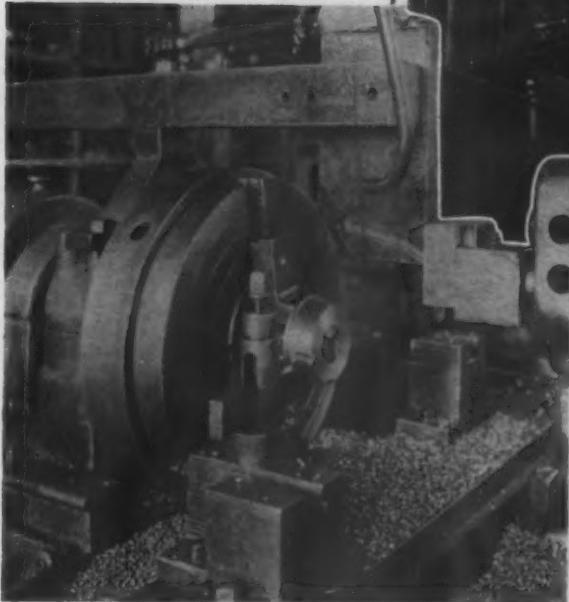


(Above) An Auxiliary Slide Carried on the Turret and Actuated by a Push Bar in the Lathe Cross Slide Permits Facing Both Sides of Eccentric Straps at Once. Two tools are carried in the auxiliary slide

(At Left) The Lubricating Hole through the Connecting Rod Was Not Drilled with a Flexible Drill. It does away with the attached oil tube formerly used, as shown at left

(Below) Making Couplings from Plate Has Permitted Decided Savings in Machine Time and Produces a More Uniform Product

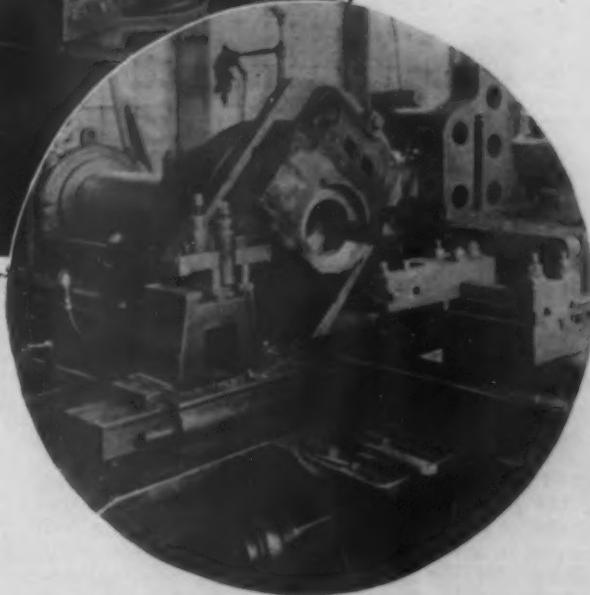




A Semi-Automatic Turret Lathe Turns a Variety of Parts with Taper or Curved Surfaces by Use of a Simple Master and Auxiliary Spindles



Coal Cutter Motor Frame Heads as Now Handled Are Produced at a Saving of 80 Per Cent as Compared with the Former Method



isfactory, as at times the tube would come loose. The oil channel now goes through the rod, extending through one branch of the jaw.

These rods are drop forged with the jaw open; that is, one branch extends at an angle from the rod, while the other conforms to the final position. Also the jaw end and box end are forged in the same plane. The rod is then twisted, bringing the box end and jaw at right

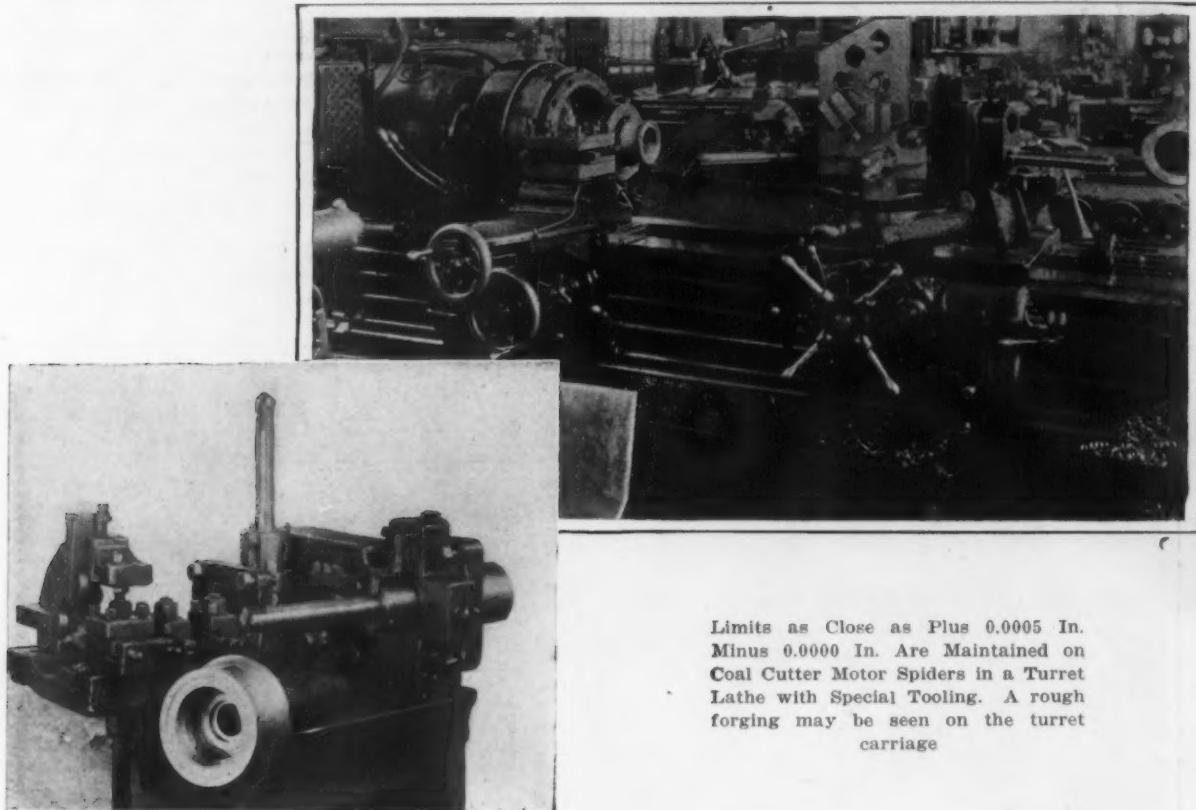
angles. After forging, the rod is drilled and a hole is drilled through the open branch of the jaw to meet the hole in the center of the rod. The open end of this hole at the pin bearing is plugged and the jaw arm closed in, symmetrical with the other. It then is ready to be drilled and reamed for the pin bearing.

A coupling used in connection with apparatus built in this shop was formerly cast. The two halves of this

coupling now are cut by torch from plate of suitable thickness and chucked in a semi-automatic turret lathe for the first operation, which is drilling and boring the center hole, then facing and turning the periphery as far as the chuck jaws will permit. The piece then is drilled and counterbored for coupling bolts from the side not yet machined. It then is set up in the turret lathe for the second turning operation, being chucked on the portion turned in the first operation. A breaking down turning operation is performed by a tool carried in the lathe cross slide. This tool leaves a flange on the coupling, back to the line of the bolt circle. From this point out a conical shaped hub is turned by a pair of cutters carried on the lathe turret, the two cutters, supported by a pilot, form turning the finished

ing. The first machine faces the frame head and machines the ball-bearing seat. The second machine faces the other side and machines the bore, in which is a taper groove. Use is made here of the auxiliary slide in the turret, pushed by the cross slide. The saving by the present method is about 80 per cent from the old method of doing the work in an engine lathe.

Armature spiders for coal cutter motors formerly were bored and rough-turned in a lathe. They then were hand reamed for a press fit requiring between 8 and 10 tons pressure, after which they were finish turned on a mandrel in a lathe. The commutator fit end of the spider is held to plus 0.0005 in. minus 0.0005 in. The other end tolerance is held to five decimal places. "Go" and "not go" gages are used for check-



Limits as Close as Plus 0.0005 In.
Minus 0.0000 In. Are Maintained on
Coal Cutter Motor Spiders in a Turret
Lathe with Special Tooling. A rough
forging may be seen on the turret
carriage

hub in one pass. This method of making the hubs assures uniformity throughout and a coupling of better material. It effects a saving of 75 per cent from the time consumed on the older type of turret lathe previously used.

Another operation in this shop makes use of the auxiliary slide as a part of the turret tool holder. This is turning contours of various radii or tapers in a semi-automatic turret lathe. To perform the work a cam or forming slide with a track of the contour desired is bolted to a rectangular supporting arm mounted across the bearing caps of the main spindle of the lathe. The bar extends over the chuck, so that the cam hangs in front of the chuck back of the work, which is so chucked that the large diameter when finished is toward the head end of the lathe. A common type of turning tool is carried in a vertical position in the tool holder with auxiliary slide, the latter resting against a spring buffer at low position by gravity. As the tool is advanced by the forward motions of the turret, a roller on the side of the auxiliary slide enters the cam track, causing the tool to describe a like contour on the work periphery.

A large part of the work in this particular shop is on coal cutter motors. In making the frame heads for these motors, which will average 29½ in. by 16 in. and 5 in. thick, one man operates four semi-automatic turret lathes, using two machines to finish each head cast-

ing. In one typical spider there are four different diameters on one end, the large diameter having three ribs which must be held to plus 0.0005 in. minus 0.0000 in.

This work now is handled complete in a heavy-duty large hole turret lathe with a roller turner carrying four tools for the four diameters. This is a special tool made in the General Electric shop, and not the standard roller turner furnished by the turret lathe maker. The saving by this method over that previously in use is about 60 per cent.

In Hartford County, Connecticut, industrial activity, based on man hours, is about 84 per cent of normal, the range being from 75 per cent in some cities to 95 per cent in others. Employment is approximately 90 per cent of normal. In the industries in the Manufacturers' Association of Hartford County, 51,500 people out of a normal working force of 58,000 to 60,000 are employed.

The receivers' sale of the Atlas Steel Corporation, Dunkirk, N. Y., originally scheduled for early in October, was postponed until Oct. 21 and subsequently postponed for one month, at the request of the officials of the company. The present expectation is that the sale will take place Nov. 21.

An American Tin Plate Plant in India

New York Engineers Make Many Modifications
to Meet Climatic Conditions—Marked Success
of Early Operations

BY F. L. ESTEP

[In THE IRON AGE of Oct. 30 the first instalment appeared of Mr. Estep's paper, read at the meeting of the American Iron and Steel Institute in New York on Oct. 24. It was devoted largely to details of construction and the measures adopted to overcome the obstacles to tin plate manufacture in India that in the minds of some who considered the project were prohibitive. The remainder of the paper, given below nearly in full, deals largely with labor problems and with operating results in the first year.]

There were received and erected a total of about 4200 tons of structural work and about 4000 tons of machinery, over 90 per cent of which had been imported from the United States and England, via Calcutta. This structural steel, together with the buildings for the Tata extensions, made a total of about 32,000 tons of fabricated steel, all of which was furnished and erected by the McClintic-Marshall Co., and at the date of contract was the second largest amount of fabricated steel ever contracted for in the United States.

Construction had proceeded far enough to make possible the first attempt at starting one hot mill on Dec. 18, 1922, and the final and successful starting up of the first hot mill took place Jan. 1, 1923. The entire plant was completed in construction and ready to operate at capacity by Sept. 1, 1923, and between that date and Dec. 12, 1923, the remaining four hot mills were started.

Bringing Workers from Wales

It was decided to secure a works manager and a hot mill superintendent for this plant who had had experience on this type of mill in the United States. There are comparatively few mills here equipped to operate on the two-roll three-part system, the majority being the straight-away American system, roughing and finishing on one pair of rolls. These two men, John Leyshon and David Samson, were secured from the Gary plant of the American Sheet & Tin Plate Co.

For the remainder of the European or cov-

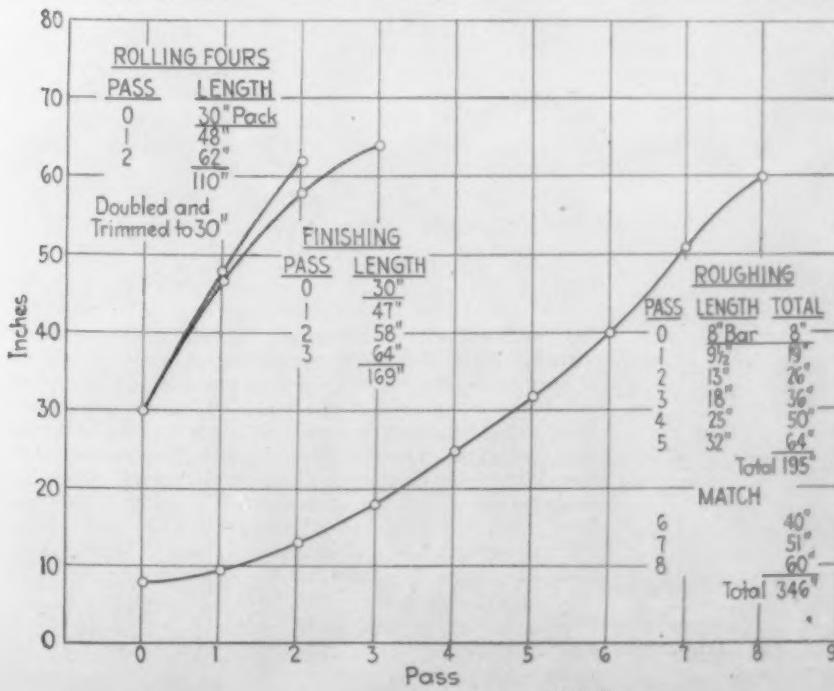
enanted staff it was thought advisable to secure experienced tin workers from Wales. Steps were therefore taken by the writer in London in August, 1922, to have the Confederation of Labor approve a proposed contract for these men, whereby for an average service of three years in India they were to be paid an acceptable guaranteed wage independent of tonnage produced, with a further understanding that a satisfactory bonus should be worked out and adapted after the mills had started operation, and it was seen how Indian labor could be trained.

About 90 men were secured from South Wales. There was 54 experienced hot mill men, 24 heaters, 21 rollers and 9 helpers, making one full crew of 18 men per shift for one hot mill. It was further proposed, and all the men understood, that later on, as the various mills came into operation, the 54 Europeans were to be divided per shift according to the number of mills in operation; that their duties would be, not only to perform the work of rolling, heating, doubling, catching, etc., but that they should also use every effort to teach the natives to do all the jobs in hot mill work.

The remainder of the men from Wales consisted of foremen for various departments, such as bar storage, hot mill, shearing and opening floor, pickling, annealing, cold rolling, tin house and warehouse; also mechanical engineer, electrical engineer, roll turner, millwrights, etc.

Many of the men were slow in becoming accustomed to the climate, and there was considerable sickness in the first year. Some men became so incapacitated that they were sent home, a few were deliberately let go, and three died—two of heat prostration and one from an accident. There were left for the operation of two mills during the summer months of 1923, up to and including the starting of the sixth mill on Dec. 12, only 43 of the original 54 hot mill men. This number has been increased to about 50 men.

Most of the men were quite happy and content, satisfied with their jobs, their wage and bonus, and very enthusiastic about the new plant in which they worked,



EFFICIENCY OF HOT ROLLING 20" X 60"—30 GAGE
28" Roll Diameter at 32.2 R.p.m.
= 2920 In. per Min.
Rolling 600 Pair = 187 Boxes in 8 Hr.
= 75 Pair per Hour Av'ge.
= 1¼ Pair per Minute Av'ge.
= 48 Seconds Av'ge per Fr. Roughing.
= 48 Seconds Av'ge per Pack Rolling Fours and Finishing.
2920 \times 48 = 2336" Roll Surface
60 per Pair or Pack Time.
ROUGHING STAND
346 = 14.1 Per Cent Efficiency.
2336 FINISHING STAND
279
110 + 169 = $\frac{279}{2336}$ = 11.9 Per Cent
Efficiency of Allowing 3 Minutes for Every 24 Packs
for Polishing or Lost Time
from Rolling $\frac{600}{24} \times 3 = 75$
Min. then Efficiency = 11.9 x
480
405 = 14.1 Per Cent.

and took readily to the method of rolling, etc. They gave full and loyal cooperation in teaching the Indians their jobs from the initial start of the plant.

Many Departures from Welsh Practice

The starting up of the hot mills was a most interesting procedure. Although 54 first-class hot mill men had been taken from Wales, only one man of the entire lot had ever rolled on a double mill in the United States, and he only as a rougher, while four other men had worked here as rollers or heaters.

Many things in regard to hot mill operations in India were entirely new to them, among which were the diameters and speed of rolls, and the rolling of packs from pairs instead of from a single bar. Furthermore, they had never had to contend with the control and balancing of temperatures and contour between roughing and finishing rolls. They had been accustomed to rolling packs from single thick bars heated five times, two rollings and sometimes only one on the roughing, and consequently there was no difficulty in regard to condition of the finishing rolls. Here a pair of thinner bars had to be completely roughed from the original heat on the roughing stand ready for doubling into fours, while the finishing stand had only two passes on fours, and two or three finishing passes on eights, and the control of condition of the finishing rolls was more difficult. The accompanying chart shows graphically how completely the roughing and finishing stands are balanced in per cent roll efficiency when working the two-rolls three-part system.

All of the rollers had been accustomed to running with very tight screws and very hot necks, and it took practically three months for the best of them to adapt themselves to a loose screw and catch on to the necessity for and the use of steam on the rolls and water on the necks for control of temperature and contour.

The heaters were not used to furnaces of the type and design installed, either pair or sheet, and very few had ever had occasion to use stokers, while the coal which they have in Wales is far superior to anything available in India.

Creditable Production Records

The initial start on the first mill was made Dec. 18, 1922, and on account of doubler troubles and the holiday season, it was Monday, Jan. 1, before the first mill went into operation for good. In the second week the men thought they had reached the limit of mill and crew capacity, when 500 pair of 30 gage were made on one shift, rolled $18\frac{1}{4}$ x 56 in. On Wednesday of the third week of operation, by special inducement, the three shifts made in succession, first, 608 pair; second, 704 pair; third, 742 pair, all $18\frac{1}{4}$ x 56 in. There were some, but not much, bad black plate in these three shifts. The men thus very early found out that the furnaces and mills had a capacity far beyond the limits of human endurance. Nobody could ever have made them believe that over 700 pair could be rolled in eight hours, but after their own demonstration they had to accept the fact.

The largest week's output on two mills was made during the week ending September, 1923, when fifteen shifts turned out 4483 boxes, an average of 149.4 boxes, or 7.07 tons, of sheared black plate, per mill per shift, practically all $18\frac{1}{4}$ x 56 in., 30 gage. Incidentally in a previous record week, ending April 28, 1923, when 4437 boxes were made, the entire week's run was made without changing rolls. The greatest 24-hour output on two mills was on Tuesday, Aug. 7, 1923, when 995 boxes were made, an average of 166 per mill per shift. The outside temperature was 77 deg. minimum, 92 deg. maximum, with the humidity 72 per cent, while in the afternoon the air to the men was at 86 deg. and humidity of 79 per cent.

The third mill was put in operation on Sept. 3, the fourth Oct. 15, the fifth, Nov. 14, and the sixth, or last mill, on Dec. 12, 1923. It is interesting to note that there was very little change in the average number of boxes produced per mill per shift during this period. The six mills are now running with less than three Europeans per mill per shift on the average.

For the entire year of 1923, there was hot rolled a

total of 213,940 base boxes, an average of 131.5 boxes per mill per shift. The best total week's production on the hot mills for six mills was for the week ending Aug. 30, 1924, when a total of 12,910 base boxes was rolled in 15 shifts, or an average of 143.14 boxes per mill per shift. Based upon the operation up to date it is conservatively estimated that for 50 weeks operation the plant will have a capacity of 600,000 boxes minimum to 700,000 boxes maximum per year.

Feeding Conveyor for Cold Rolls

In regard to the hot mill rolls, the first shipment left the United States Oct. 8, 1921, and the last shipment March 16, 1922. All these rolls had lain in the open at the works until the plant was up and the roll lathes ready to turn rolls. This aging and slow annealing process has resulted in a very long life, and up to Jan. 1, 1924, only five hot rolls had been broken. This is a good record considering that as early as March, 1923, in the third month of operation, Indians were being taught to rough and four roll, and naturally several pairs of tongs were rolled.

The Indian, although very adept and very capable when it comes to doing the same operation over and over again, could not set any pace for himself, and the difference that was found between the use of Indian labor on the cold rolls and Indian labor in the hot mills was principally that at the hot rolls there were a number of white men interspersed among a given number of Indians constituting a crew, and the white men set the pace.

It was, therefore, found necessary to do something radical at the cold rolls, and a feeding belt conveyor was designed and built for trial on one set of cold rolls, thinking that it would solve the problem. This device was a success from the very start, one set of rolls handling 550 boxes in seven hours on the third day of trial operation. Additional conveyors were built as fast as possible, and installed so that since the week of Jan. 26, 1924, all four sets of cold rolls have been operated with feeding conveyors.

The greatest output on any one set of cold rolls was during the week ended Oct. 27, when in six days of eight hours, one set equipped with a feeding conveyor cold rolled 3900 boxes, and the best week's record for the same number of hours' operation on the four sets of cold rolls, all equipped with conveyors, was for the week ended Feb. 2, 1924, when a total of 12,466 boxes were cold rolled.

There were tinned during the year 183,080 base boxes of which 143,838 boxes were "primes," 37,292 boxes of "firsts," and 1950 boxes of "seconds." The black and white pickling for the year was done with a consumption of seven pounds of sulphuric acid and the tin yield was 1.69 pounds per base box.

The record up to date on two tinning machines is 6007 boxes made during the week ending Sept. 8, 1923, in 120 hours of operation; the best record on three machines was 9038 boxes, made during the week ending Nov. 3, 1923, in 117.7 hours of operation, and the best week's output on four machines was 9754 boxes during the week ending Jan. 19, 1924, in 119.1 hours of operation.

Second-Hand Cans Have Value in India

It may be of interest to note here that in most countries, particularly in the United States, tin plate is made to answer one primary purpose only; namely, that of making up a container to hold some specified article. When this container has once been emptied it is thrown in the waste pile, and probably 80 per cent minimum of the amount of tin plate used has no second-hand value whatever, not even as scrap. In India, however, especially when tin plate is made into rectangular two Imperial gallon petrol cans and shipped over the country, the empty tin cans have a very high second-hand market value, and all these cans are very carefully preserved and sold into the "bazaars," or markets. Here the native buys one to several dozen of cans, cuts them apart and beats them up into all manner of articles, such as cooking utensils, water basins, drinking cups, ornaments, and even makes him a house of it.

(Concluded on page 1261)

PLUNGE-CUT GRINDER

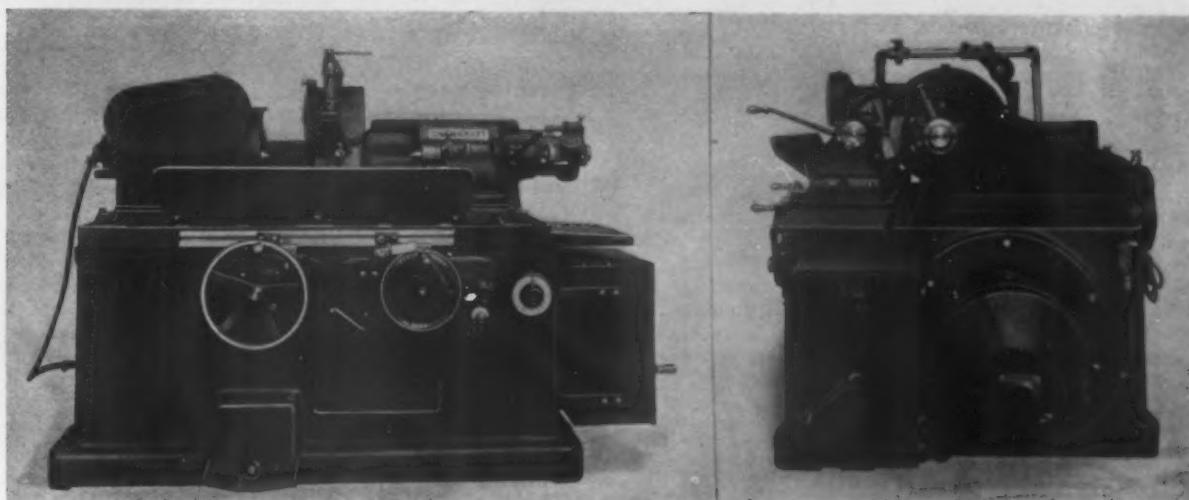
Wide-Wheel, In-Feed Machine with Reciprocating Spindle Adapted to Production Work

A wide wheel in-feed grinder described as the "plunge-cut" grinding machine, having the spindle reciprocating in its bearings, has been placed on the market by the Cincinnati Grinder Co., Cincinnati.

The grinding is done by directly feeding into the work with a wheel, the face of which covers the entire surface being ground. In the case of parts the surfaces of which are longer than the maximum wheel face, the in-feeding is along the work at successive intervals, the face of the wheel overlapping slightly each previous cut. When the entire length is ground, the work is moved rapidly past the wheel to complete it. The machine is adapted to the grinding of duplicate parts that may be ganged on a mandrel or other convenient chuck-

by power. When feeding by hand, a positive stop is used for duplicate work. The power feed can be thrown out automatically after the work has been reduced to the size required. Twelve feeds, ranging from 0.054 to 0.162 in. per min. in the reduction of work diameter, are available. The power feed arrangement provides uniform feed and is driven by an adjustable-speed fractional horsepower motor, controlled by a rheostat.

The headstock is adjustable on the swivel table. It has a hardened and ground stud spindle, with a taper hole for the work-carrying center. The work is revolved by a motor mounted in the headstock housing, the drive from the motor to the drive plate being by means of a silent chain, worm and worm wheel. As the work center is directly over the center line of the base guideway closest to the grinding wheel there is always a support immediately under the work. Alignment is preserved by a truncated vee-shaped keyway, cut into the bottom of the headstock and extending its entire length, which keyway receives a key of corresponding form cut in-



Front View of Wide-Wheel Plunge-Cut Grinder Is at the Left. Control is centralized at the front of the machine, levers being within convenient reach from the operating position. From the end view at the right, may be seen the arrangement of the main drive motor

ing device, as well as to the grinding of single pieces in quantity.

The wheel base is fixed and the work table is movable. Accurate and durable construction is said to be provided by casting the base, wheel slide pedestal, and water tank in a unit, by having the wheel slide move transversely only, and by mounting the cross-feed mechanism rigidly at a fixed point on the base casting.

Self-contained construction is a feature, the various motors, shaft and driving mechanisms being contained within the machine. The machine is rated at 20 hp. and motor drive is recommended. The headstock motor and the main drive motor are dynamically balanced and are conveniently accessible for repair or replacement. The headstock motor is mounted in the headstock housing and the main drive motor is placed partly in and is carried by the base of the machine, as shown in the end-view illustration. The main motor is connected to the wheel spindle driving pulley by an endless belt held in tension by idler pulleys.

The unit system of construction is followed, which provides accessibility for repairs or adjustments, and convenient lubricating facilities are a feature.

The base is of box section and is provided with a flat and a vee-way, the latter serving as a guide for the sliding table. The table traversing mechanism is of the hand-operated type, and is carried by a plate on the front of the bed. It is used for bringing the work before the wheel and for use in truing the wheel. Movement of the table is by means of a large hand wheel, one revolution of which advances the table $\frac{1}{2}$ in. Stops are provided for use in grinding to shoulders. The cross feed to the wheel slide is mounted at a fixed point on the bed casting, and may be operated either by hand or

tegrally with the swivel table. The headstock is controlled by a foot-treadle at the base of the machine.

The wheel slide is held in place on the ways of the wheel slide platen by its own weight, and by the downward pressure of the spindle belt. It is counterweighted to compensate for backlash. The wheel slide vee-way is located approximately central between the spindle pulley and the grinding wheel. The cross feed screw operates in a solid cast-iron nut, which is located in the wheel slide vee-way. The design is claimed to provide a completely balanced and free moving unit.

The wheel spindle is a heat-treated chrome-nickel steel forging and runs in bearings of the half-box type, the body of which is of cast iron and lined with special white metal. The spindle is held in the bearings by the downward pull of the belt. Lubrication is by means of large disk splashes revolving on the spindle. A shoe in the bearing cap may be adjusted downward against the spindle, this being intended as a safeguard should the spindle belt break. The spindle reciprocating device moves the spindle back and forth in the direction of its axis, with a uniform motion, a distance of $\frac{3}{16}$ in. 50 times a minute. It can be made operative or inoperative at will. The device is said to maintain an even cutting face on the grinding wheel for a longer time, reducing the frequency of dressing, and to break up the grain lines of the wheel on the work.

Four sizes of the machine are available. The swing over the table is 18 in. in all sizes, and the distance between centers is 19, 37, 49 and 72 in. respectively. The floor space required is 68 x 117 in. for the smallest machine and 68 x 171 in. for the largest, the weight of the same machines being 10,300 lb. and 13,400 lb. net, respectively.

TO SEEK RATE REVISIONS

Pittsburgh Steel Company Traffic Officials Discuss New Conditions

PITTSBURGH, Nov. 3.—A very full discussion of the effect of the abolition of the Pittsburgh plus method of quoting steel upon the prices obtainable by steel companies in Pittsburgh and nearby districts was had at a meeting held at the Chamber of Commerce here last Thursday of steel company traffic officials called together by A. R. Kennedy, traffic manager Pittsburgh Steel Co., Pittsburgh. While there was some hesitancy on the part of the representatives of Youngstown steel companies to go on record positively that the change had been harmful, those attending from other districts gave several instances, notably in the West and South, where more favorable freight charges from competing mills in those districts had forced price concessions or freight equalizations to hold customers. It was the view of many who spoke that the new arrangement had not been in effect long enough to give a fair line on what the change ultimately would mean and with a return of more nearly normal demands for steel expected after the Presidential election, a better idea of the effects could be had.

The Jones & Laughlin Steel Corporation case, now pending before the Interstate Commerce Commission, was frequently referred to in the discussions. This case has to do with a demand for an adjustment of rates on finished iron and steel products from Pittsburgh to St. Louis and to points in Indiana and Illinois more nearly proportionate with those from Chicago district and Indiana mills. Pittsburgh district mills now pay the full fifth class rates to those points, while the Chicago and Indiana mills enjoy commodity rate classification which results in a charge

of only 55 to 65 per cent of the fifth class rates. Attorney-examiner William A. Disque, who took the testimony in the hearings on this case, made a recommendation that Pittsburgh rates to the disputed points be made 80 per cent of the fifth class rates, with sixth class rates as a minimum and that rates from the Chicago district and Indiana mills be raised to a more equitable level. The Interstate Commerce Commission has not yet rendered a decision in this case and there was a belief among some speakers at Thursday's meeting that it probably would be some time before one would be made and that there was a possibility of an unfavorable decision.

It was generally agreed that in the latter eventuality, Pittsburgh district producers would not be in a position to take up the matter promptly and to be prepared, it was decided to appoint a committee to study the situation thoroughly and make a report at another meeting to be held in about two weeks. The various districts are represented in this committee, Canton, Ohio, by R. B. Robinson, United Alloy Steel Corporation; the Youngstown district by H. D. Rhodehouse of the Youngstown Chamber of Commerce; the Wheeling - Steubenville - Weirton district by W. F. Morris, Weirton Steel Co. and A. P. Oxtoby, Wheeling Steel Corporation; the Beaver Valley district by M. P. S. Orner, Pittsburgh Bridge & Iron Co.; the Johnstown district by H. C. Crawford, Bethlehem Steel Co. and the Pittsburgh district by A. R. Kennedy, Pittsburgh Steel Co., J. J. Eichenberger, Pittsburgh Crucible Steel Co., H. N. Holdren, Pittsburgh-Des Moines Steel Co., John Mathews, Central Tube Co., and D. O. Moore, Chamber of Commerce of Pittsburgh.

It was pretty generally agreed that it would be futile to ask the carriers to make any rate revisions before the Jones & Laughlin case was decided and it was uniform opinion that if lower rates were asked on shipments west, western mills would be entitled to lower rates east.

CHANGES IN CUTTING TOOLS

German Association Expert Suggests Betterment to American Makers

Dr. George Schlesinger, technical director of the Machine Tool Builders' Association of Germany, and in charge of their research laboratory at Charlottenburg, addressed the meeting of the Cincinnati section of the A. S. M. E., Oct. 27, and the local members of the National Machine Tool Builders' Association were invited guests. Dr. Schlesinger, by means of charts and lantern slides, explained some of the research work conducted in Germany, particularly the tests for cutting tools and power required to operate machines. He also described the progress made in standardization of machine parts.

Dr. Schlesinger is visiting plants in this country, studying progress made in machine designing. He finds that while there have been many important changes in machine tool design during the past 20 years, few advances have been made in the design of cutting tools. From his observations, he suggests that manufacturers, by intensive study, could develop cutting tools that would be a considerable improvement over those now in use, particularly as to the life of a tool before regrinding is necessary.

New California Plant of Westinghouse Electric & Mfg. Co.

Machinery and other equipment are being moved into the new Emeryville, Cal., plant of the Westinghouse Electric & Mfg. Co. This is the second unit in the company's \$3,000,000 program across the bay from San Francisco.

The new assembling plant covers a ground area of 50,000 sq. ft. and is a 3-story concrete and steel structure. Two railroad sidings have been run into the building. As expansion becomes necessary, two

additional units will be added, each approximately as large as the present building.

When the entire development has been completed, it is estimated that the cost will approximate \$3,000,000 and that more than 1000 persons will be employed. Emeryville is the manufacturing center for the Westinghouse Electric & Mfg. Co. in the West and it is supplemented by large warehouses and service shops in San Francisco, Los Angeles, Denver and Seattle, as well as in Honolulu, where the Hawaiian Electric Co. is the Westinghouse agent.

Rules as to Delivery of Pipe Declared Unreasonable

WASHINGTON, Nov. 3.—In a decision handed down on Thursday of last week, the Interstate Commerce Commission held that rules and regulations restricting delivery of cast iron soil pipe, in carloads, at piers Nos. 10, 11, 39, 46, and 81, North River, Manhattan Island, New York, are unreasonable. The defendant was the Central Railroad of New Jersey, against which a cease and desist order was issued. The complaint was brought by the Somerville Iron Works, manufacturer of cast iron soil pipe at Somerville, N. J.

Prior to Aug. 26, 1923, the railroad transported carload shipments of soil pipe tendered it by the complainant at Somerville to Jersey City by rail, thence by float to its pier stations on North River, at a rate of 11.5c. per 100 lb. Effective on that date the railroad published restrictions on the delivery of iron pipe, any quantity, at all of its pier stations on the North River, except Bronx terminal, and thereafter refused to transport the complainant's shipments beyond Jersey City. The rate from Somerville to Jersey City is 8c. per 100 lb. From May 16, 1913, until Feb. 25, 1921, the delivery of all iron pipe was restricted at the railroad's North River piers, but that restriction was lifted, effective Feb. 26, 1921, on iron pipe 5 ft. 3 in. long and was not again made effective until Aug. 26, 1923.

NEW WIRE FLATTENING MILL

Machine for Making Nut Stock Equipped with Power-Driven Edging Rolls

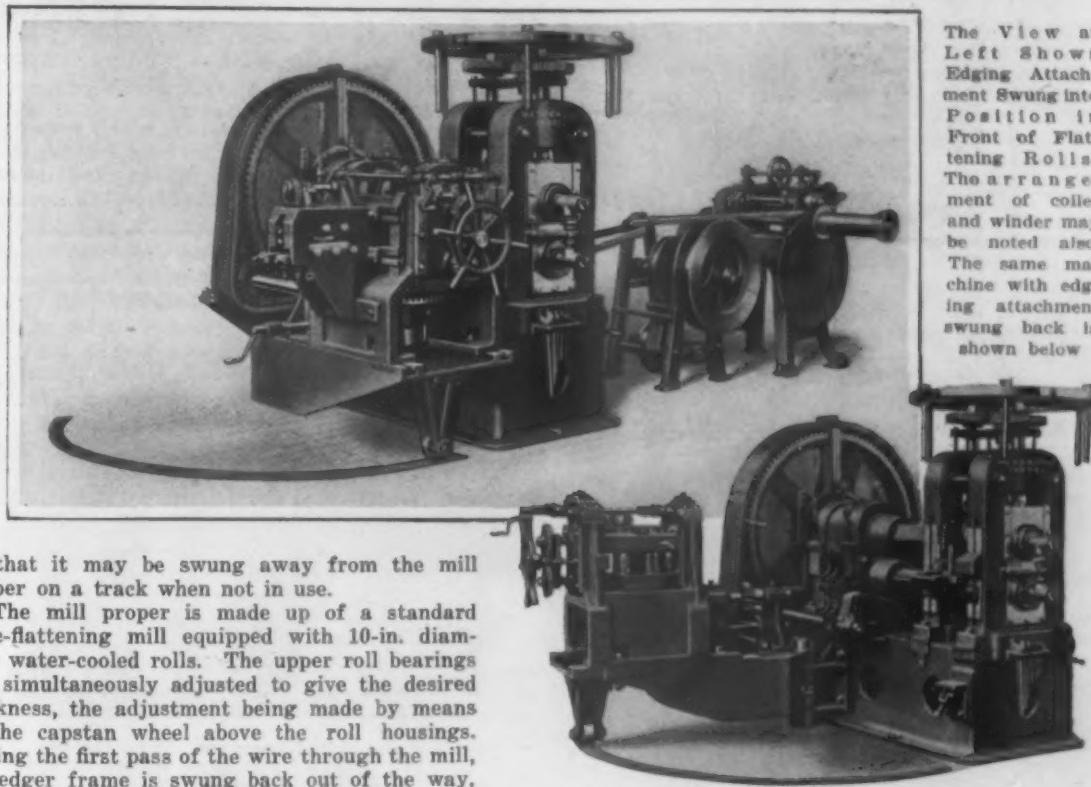
A rolling mill for making wire of rectangular section from hot-rolled steel wire, by the cold-rolling process, has been brought out by the Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

The product of the machine is known as nut stock and the mill is frequently referred to as a "nut-stock mill." Two pairs of rolls work simultaneously, one pair serving to flatten the wire and the other pair to square the sides. The latter are known as edging rolls and are contained in an auxiliary attachment, which is arranged

the accompanying illustration of the machine. If the stock is to be wound, it is passed over a table at the rear of the mill and on to the winder spool; if the stock is to be coiled, a guide having a rectangular hole through it is used to bridge the space between the mill and the coiler and pass the stock over the winder.

Where only one mill is employed the stock must be handed back and forth using the edger after the first pass, readjusting the rolls until the correct size is obtained. The smaller sizes, up to $\frac{1}{4}$ in. x $\frac{1}{2}$ in., can be produced in three passes through the flattening rolls, one pass without using the edger and two passes with it. On larger sizes four passes are necessary. It is claimed that this equipment will produce nut stock within 0.002 in., plus or minus basic size.

Although usually motor-driven, the mills may be



so that it may be swung away from the mill proper on a track when not in use.

The mill proper is made up of a standard wire-flattening mill equipped with 10-in. diameter water-cooled rolls. The upper roll bearings are simultaneously adjusted to give the desired thickness, the adjustment being made by means of the capstan wheel above the roll housings. During the first pass of the wire through the mill, the edger frame is swung back out of the way, and on the second pass it is swung into position in front of the mill. The edging rolls are driven by a roll clutch. The flattening rolls are driven somewhat faster than the edging rolls, so that when they start to grip the stock, the surface speed of the edging rolls becomes increased to equal that of the flattening rolls and the roll clutch is automatically released. The clutch then acts merely as a reserve drive and in case the flattening rolls slip on the stock, reducing slightly the rate of feed, the roll clutch becomes engaged automatically and the edging rolls feed the wire until the flattening rolls regain their traction on the wire. If this provision were not made, it would be necessary to release the edging rolls manually to permit the slipping flattening rolls to continue feeding, which would cause inaccuracies in gage.

The edging rolls have a series of grooves corresponding to the thickness of section at each pass and they are mounted vertically in the edger frame. Suitable adjustments are provided for the edging rolls to agree with the width of stock and its position between the flattening rolls. The edger frame has provision for attaching a roll straightener which is sometimes required and this straightener is adjustable relative to the line of feed, as well as vertically.

If the quantity of work to be produced warrants the use of two or three mills, the wire may pass directly from one mill to the next without intermediate handling. In that case the first mill would require no edger and no straightener and the wire would pass from the flattening rolls of the first mill into the edging rolls of the second, through the flattened rolls of the second and so on to the end of the line. In back of the last machine a winder and a coiler would be arranged, as shown in

arranged for belt drive if desired. The edger is driven from the main driving gear of the motor-driven mills. If one mill is to be used for several sizes of stock, a variable speed motor is recommended, high speeds being employed for the smaller sizes and low speeds for the larger sizes. For belt-driven mills the edger is driven independently by belt, usually from overhead. The weight of the motor-driven mill with edger is 15,900 lb., the weight of the belt-driven machine being 11,775 lb.

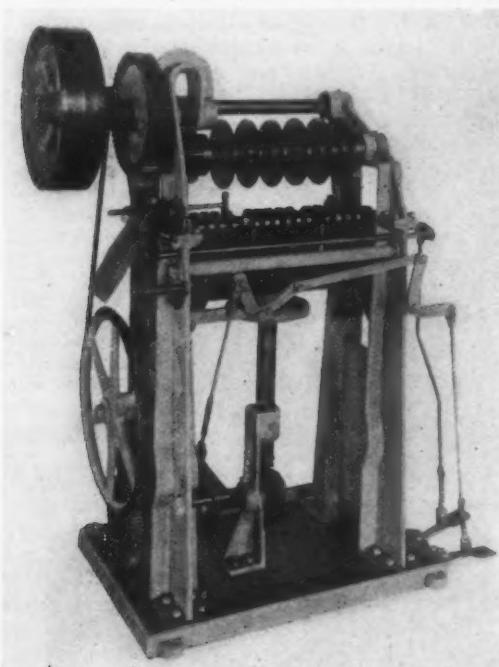
Leaders of the iron and steel industry of the Mahoning Valley joined in a tribute last week at Youngstown to Robert Bentley, on the occasion of his seventieth birthday. Mr. Bentley is a director of the Youngstown Sheet & Tube Co., and president of the Ohio Iron & Steel Co., now a holding interest, which for many years operated Mary blast furnace at Lowellville, Ohio, now the property of the Sharon Steel Hoop Co., Sharon, Pa. President James A. Campbell of the Sheet & Tube company, for 50 years a friend and associate of Mr. Bentley, commented upon Mr. Bentley's philanthropic activities. The testimonial was sponsored by the Youngstown Rotary Club, with Valley steel property executives as guests.

Improvements will be made in certain details of the Emmet mercury boiler and turbine installation at the Hartford Electric Light Co., Hartford. During the time that the changes are being made visitors will not be admitted to the station.

Tubing Cut Into Several Pieces at One Operation

A machine designed to cut tubing or pipes into a number of pieces in one operation, by bringing the stock into contact with rotary cutters, has been developed by the Leonard Machine Works, Lansdowne, Pa. The capacity of the machine is for cutting tubes of $2\frac{1}{2}$ in. outside diameter and $3/16$ in. wall thickness.

In this machine, which is illustrated herewith, the cutters are mounted adjustably on a horizontal shaft



Tubing or Pipe Is Cut Into a Number of Pieces By Bringing the Stock in Contact with Rotary Cutters

which is driven through double back gearing and a pulley. The cutters may be removed conveniently from the shaft for replacements, or the entire shaft assembly may be taken out. The cutters may be sharpened by an electric grinder while they rotate on the machine.

A number of tube rests are mounted in a dove-tail groove in the table of the machine, and are positioned to correspond with the cutters. The height of the table is adjustable to accommodate tubes of different diameters and to compensate for wear of the cutters, the adjustment being made by turning the handwheel located at the top of the plunger rod which bears against the under side of the table. The table is raised by means of the cam on the shaft at the bottom of the machine, this shaft being rotated one revolution through a clutch operated by a foot treadle. The shaft is driven from the main drive at the top of the table through chain and spur gearing. The table has long bearing surfaces which fit the upright housings at each end.

In operating the machine the attendant places a long tube on the table, and then depresses a treadle which controls the work stop, and finally the treadle that operates the clutch. The cut pieces of tubing are pushed off the machine when a new piece of tubing is inserted. The machine has been patented by N. F. Fretter.

Gustave Kahn, vice-president of the Truscon Steel Co., Youngstown, in charge of sales, has returned from a trip to the Pacific Coast, and reports a satisfactory business outlook. Operations of the Truscon company are averaging 75 per cent. While the demand for fabricated steel materials for general construction continues firm, there has been a perceptible slackening in requirements for highway reinforcing materials.

New Gasoline Locomotive

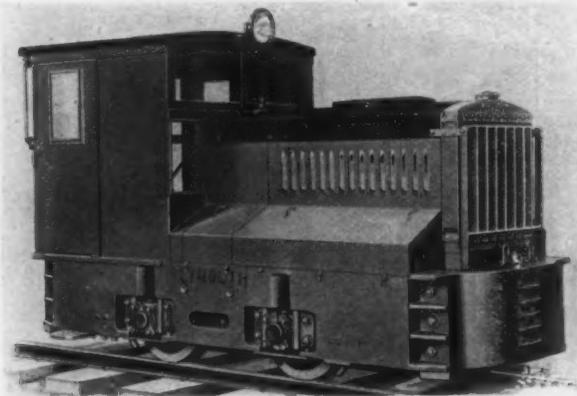
The Fate-Root-Heath Co., Plymouth Locomotive Works, Plymouth, Ohio, has brought out a new gasoline locomotive known as model DLC, Type 6, which weighs 8 tons.

The machine is equipped with Climax model TU 4-cylinder engine, $5\frac{1}{2}$ -in. bore by 7-in. stroke, developing 65 hp. at 900 r.p.m.; Bosch high tension magneto with impulse coupling; Simms 12-volt starter and Willard storage battery; Stromberg carburetor; United air cleaner and built-in governor. Cooling is by means of a Modine sectional core radiator and 22-in. gear driven fan. The radiator is protected by heavy guard.

The transmission is of the company's sliding gear type, four-speed forward and reverse. The axles, which are of alloy steel, heat treated, are $4\frac{7}{16}$ in. in diameter, and the wheels are of rolled steel, 24 in. in diameter. Brakes are of the lever type to all four wheels, and sand is by hand to all four wheels, the sand boxes being located close to the engine to keep the sand dry.

The cab is 84 in. high, overall, which permits the operator to see over industrial cars. The cab is provided with side entrance, with sliding steel doors, to eliminate the danger from exit between the locomotive and car, as in the case of rear opening only.

Speeds of $2\frac{1}{2}$, 4, 8 and 12 miles an hour, at engine



Eight-Ton Gasoline Locomotive. The draw-bar pull at $2\frac{1}{2}$ m.p.h. with sand, is 6000 lb.

speed of 900 r.p.m., are provided. The draw bar pull, at $2\frac{1}{2}$ m.p.h. with sand, is 6000 lb.; at 4 m.p.h. with sand 4800 lb.; without sand 4000 lb.; at 8 m.p.h. 2400 lb.; at 12 m.p.h. 1600 lb.

New Book on Aluminum

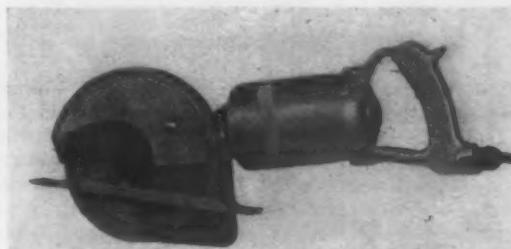
Announcement is made by Henry Carey Baird & Co., Inc., 2 West Forty-fifth Street, New York, that a new volume of "Metallurgy of Aluminum and Aluminum Alloys" will be ready for distribution early in January. This book was originally written by the late Dr. Joseph W. Richards, Lehigh University, Bethlehem, Pa., and has now been rewritten and brought up-to-date by Robert J. Anderson, an authority in this field. The last edition, which was the third, was published in 1896. The new work is described as a complete and thorough presentation of the metallurgy of aluminum covering the subject from the mining of bauxite to the uses and applications of the metal and its alloys. While it has been more the purpose of the author to produce a practical work, the theoretical aspects have not been neglected. It is stated that the book will be of value, not only to metallurgical engineers and foundrymen, but also to automotive and mechanical engineers. It will contain over 800 octavo pages and 297 illustrations. The price will be \$10 net.

In the first half of 1924 Canada exported to the United States \$825,189 of farm implements, compared with \$1,833,064 during the whole of 1923.

Portable Electric Hand Saw

A portable electric hand saw, known as the Skilsaw, for cutting wood, sheet metal and building compositions, has been developed by the Michel Electric Hand Saw Co., 166 East Grand Avenue, Chicago.

The machine is 19 in. long, 4 in. wide and 8 in. high, and weighs approximately 14 lb. A universal motor drawing 5½ amperes at 110 volts with a no-load



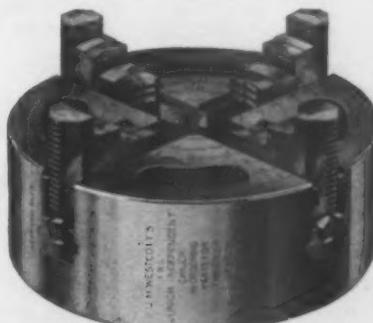
The Weight Is 14 Lb. A universal motor is employed and a trigger switch is in the handle. The steel saw is 8 in. in diameter

speed reduced to 10,000 r.p.m. by automatic control, is employed. Cooling is by means of a suction type typhoon fan. A 6-amp. Hart & Hegeman trigger switch is mounted in the handle and 15 ft. of attachment cord is provided. The shafts are mounted in ball bearings and gears and bearings are inclosed in an oil tight chamber. The steel saw is 8 in. in diameter. The body is of a highly finished aluminum alloy.

Independent Lathe Chuck

What is known as the Junior IXL, independent lathe chuck, illustrated herewith, has been placed on the market by the Westcott Chuck Co., Oneida, N. Y., for use on light lathe work and for use in manual training schools. It is the same as the company's standard IXL chucks, except that body, jaws, screws, etc., are lighter.

Each jaw screw is provided with a hardened steel carrier which is intended to distribute the thrust so



Independent Chuck for Light Lathe Work and Use in Schools

that the body will not spring or break. These screw carriers, which furnish steel thrust bearings for the screws, may be removed when they become badly worn. The ease with which the screw carriers can be driven out is also a feature emphasized. The jaws are of steel, and after being case hardened they are carefully ground and fitted. The screws are of steel and tempered and are squared on both ends. The body is of gray cast iron. All parts are interchangeable. The chuck is offered in 5, 6, 8 and 10-in. sizes.

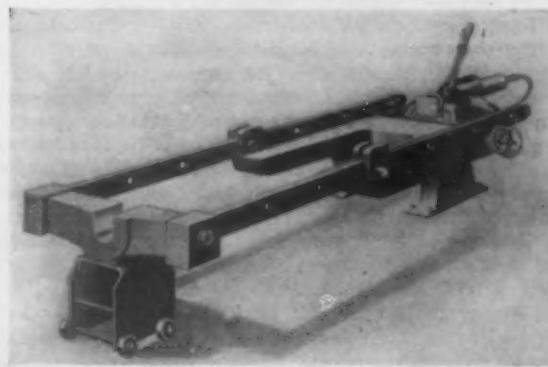
Domestic sales of oak leather belting during September amounted to 348,251 lb., in value \$581,231. This compares with 326,901 lb. in the preceding month, in value \$551,809, and is a considerable recession from the corresponding month of 1923, with sales of 416,510 lb., in value \$783,871, as reported by the Belting Exchange, representing 60 per cent of total product.

Combination Vertical-Horizontal Press for General Shop Use

The Watson-Stillman Co., 50 Church Street, New York, has placed on the market a general utility shop press, which combines in one unit a vertical press for forcing, bending, straightening, pressing, etc., and a horizontal press for all the operations which are ordinarily done on a press of that type.

The press shown in the accompanying illustration is a composite unit made up of a 60-ton pipe bender, a 60-ton shaft straightener, a 60-ton die sinking and upsetting press, a 60-ton vertical forcing press, a small hand-power arbor press, a 7-ft. horizontal forcing press, and a 60-ton horizontal forming and bending press.

The change from vertical to horizontal press is made by rotating the hand wheel shown at the rear, this change being made without the assistance of a crane or jack. In the horizontal position it may be used for bending structural shapes, bending pipe, bars, force fitting, forcing on and off gears, disks, wheels, and other work. The bed of the press is planed smooth and the forming tool on the end of the ram is supported on this bed. The abutment beam may be moved out a



Hydraulic Vertical-Horizontal Press in the Extended Horizontal Position. The change to horizontal is by means of the handwheel

maximum of 7 ft. for forcing long shafts. A four-wheel truck is provided, as shown, to facilitate handling and also to support the beam in extended position.

Hydraulic pressure is employed only for the high-pressure stroke of the ram. The idle portion of the forward stroke and the return movement is effected by a pinion which meshes with a rack in the ram, this rack and pinion device being of sufficient power to permit using the press for light arbor work without hydraulic power. The press is usually equipped with a hand pump complete with hydraulic gage, pipe and connections. It may be operated also by a small two-plunger power pump.

The capacity is 60 tons. The ram stroke is 10 in., the vertical opening 18 in. and the horizontal opening 84 in. The weight is 3700 lb. Patents are pending.

Catalog Compiled by Stoker Association

A condensed catalog of mechanical stokers, compiled recently by the Stoker Manufacturers Association, is made up of 32 pages, 8½ x 11 in., and is unique in that it is a complete catalog of various competitive manufacturers of mechanical stokers. The descriptive matter is confined to engineering facts, presented not as advertising, but as a matter of information.

The catalog is divided into three main parts, embracing nine chain grate, 16 underfeed and 3 overfeed stokers, respectively. General information is given on each of the three types, this being followed by an illustrated description of each machine. At the back of the book are postcards addressed to each of the companies whose machines are described, these being intended for use in sending for further details. Copies of the catalog may be obtained from W. V. McAllister, secretary Stoker Manufacturers Association, foot of Walker Street, Detroit.

Iron Ore Available for United States

Reserves of the World Which May Be Smelted in American Furnaces—Our Own Reserves Should Last 250 Years

BY OLIN R. KUHN*

OF recent years the production of pig iron has increased so rapidly that some concern has been voiced as to where the supply of iron ore will come from after the present reserves of high-grade ores in the Lake Superior district have been depleted. In fact, several large steel companies have purchased vast foreign properties to utilize after the ore supply in this country becomes more scarce. But even if the production of pig iron continues to increase at the present rate until the higher grade ores become exhausted, the furnace operators will utilize the lower grade ores, of which there are enormous reserves.

Assuming that the production of pig iron increases during the next ten years at the rate of 1,000,000 tons annually—the increase over the last 30 years has averaged between 1,000,000 and 1,500,000 tons per year—and thereafter at half this rate, or 500,000 tons annually (Table I and diagram), the United States will consume over 12 billion tons of iron ore over the next 100 years. According to these calculations the reserve ore available for consumption by this country (Table III) will become depleted about 2043 A. D., or in 120 years, and the potential reserve of low-grade ores will last another 135 years.

Thus there is little danger of any serious shortage of iron ore in this country for 250 years or more, and

by that time, or long before, some large, now unknown, reserve may be discovered or some other material may replace iron. Of course these figures seem ridiculous, but when one considers the vast reserve of low-grade ores in this country (just beginning to be utilized) which in the near future will be more generally used, the figures do not seem so out of proportion. Charles P. Perin, New York, recently stated that the world's reserve of iron ore would be completely exhausted in about 290 years.

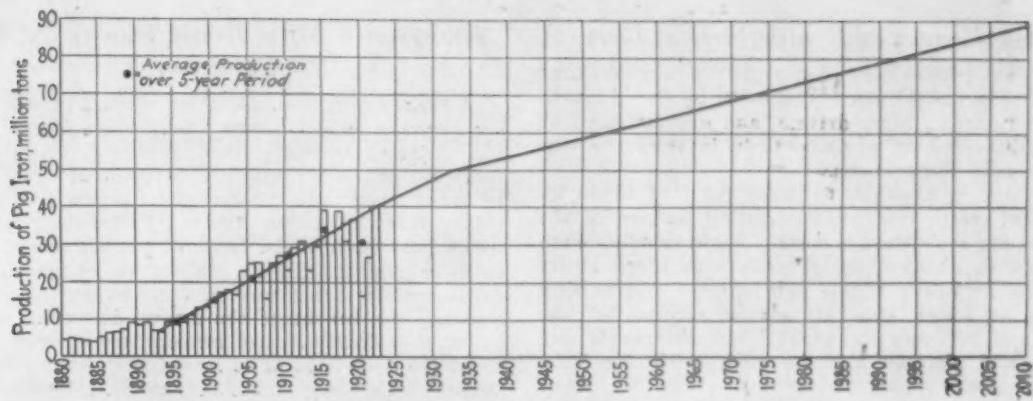
One thing that must be kept in mind, however, is that about 85 per cent of the ore consumed in this country at present comes from the Lake Superior district and, although these ranges contain large tonnages of high-grade ore, they are being depleted rapidly—from 50 to 60 million tons of ore is shipped from the Lake district annually. At this rate of mining the reserve of high-grade ore (50 per cent natural iron or more) will last from 20 to 30 years only and the reserve of lower grade direct smelting ore (45 to 50 per cent natural iron) will last another 10 or 15 years. About half of the reserve of high-grade ores in the Lake Superior district is owned or leased by the United States Steel Corporation and the Bethlehem Steel Corporation for consumption in their own furnaces.

During the last few years some experimenting and development has been carried on toward utilizing the low-grade ores (35 per cent iron content) and the Me-

*Donner Steel Co., Buffalo.



LOCATIONS of
Iron Ore
Fields of North
America and
Contiguous
Lands Which
Should Furnish
Ore Available
for Consumption
in the United
States. Develop-
ment in some
cases scarcely
has begun. The
total tonnage of
reserves is
enormous.



United States Pig Iron Production from 1880 to 1923, with Estimated Normal Growth to 2010.
Assuming Increase of 1,000,000 Tons per Year Until 1933 and 500,000 Tons per Year Thereafter

sabi Iron Co. on the eastern end of the Mesabi Range is now producing a sinter which it sells on a commercial basis. The low-grade magnetite is crushed through a 200-mesh sieve, concentrated and sintered, and the final product contains from 60 to 65 per cent iron.

To show more clearly the reserves of iron ore available for the United States, a short outline of the more important reserves of the world will be given. Figures on reserves of ore always have been conservative, and of recent years several large deposits have been explored and at present the reserve of iron ore in the world is probably closer to 40 billion tons than to the 30 to 35 billion tons, as given in previous estimates.

United States of America

The Lake Superior district in Michigan, Minnesota and Wisconsin is the largest producing district in the world, and includes six ranges, the largest of which is the Mesabi, which is estimated to contain from 1½ to 2 billion tons of high-grade ore. The other ranges, or Old Ranges (Vermilion, Cuyuna, Marquette, Gogebic and Menominee) in this district probably contain another 1 to 1½ billion tons. Most of the ore is hematite, although there is some high-grade magnetite, and the eastern end of the Mesabi Range is said to contain 30 to 40 billion tons of low-grade (35 per cent iron) magnetite. About 42 million tons of ore, averaging over 51 per cent natural iron content, was shipped from the Mesabi Range in 1923. The ores of the Old Ranges are

slightly harder in structure and, as a rule, higher in iron content, than the Mesabi ores. The United States Geological Survey credits the Lake Superior district with a reserve of 2 to 2½ billion tons of ore averaging over 50 per cent natural iron content, and from 1 to 1½ billion tons of ore averaging 45 to 50 per cent iron. The potential reserve of ore averaging from 25 to 45 per cent iron is placed at 65 to 70 billion tons.

The Northeastern States district contains the next largest reserve of high-grade ore. This district includes the Adirondack region in the northeastern part of New York. F. S. Witherbee and F. L. Nason, in papers before the American Iron and Steel Institute, gave the reserve of the Adirondack region at from 1 to 1½ billion tons. Much of this ore at Mineville, Lyon Mountain, Saranac, etc., is magnetite and averages 55 to 60 per cent iron in the crude state. As a rule, this ore is crushed and concentrated, which gives an ore averaging from 63 to 68 per cent iron. There are also large deposits of Clinton hematite and several large deposits of titaniferous ore near Sanford Lake, but neither of these latter reserves is used at present. The southern part of New York and the northern part of New Jersey contain deposits of magnetite at Sterlington, Fort Montgomery and Wharton, which are estimated to contain about 50 million tons. The famous Cornwall ore banks near Lebanon, Pa., have developed

(Continued on page 1248)

Table I—Pig Iron Production in the United States
Estimated Production, Millions of Gross Tons

Decade	Year	Estimated Increase	Total For Decade	Increase
Decade	Year	Per Cent	Amount	Per Cent
1924 to 1933	41	42	43	71.7
1934 to 1943	50.5	51	51.5	19
1944 to 1953	55.5	56	56.5	16
1954 to 1963	60.5	61	61.5	9.5
1964 to 1973	65.5	66	66.5	8.7
1974 to 1983	70.5	71	71.5	7.4
1984 to 1993	75.5	76	76.5	6.9
1994 to 2003	80.5	81	81.5	6.4
2004 to 2013	85.5	86	86.5	6
2014 to 2023	90.5	91	91.5	5.7

The century 7002.5
Corresponding iron ore, at 1.8 tons per ton of pig iron 12,604.5

*Last figure of year, thus: 1924, 1934, 1944, etc.; in the next column, 1935, 1935, 1945, etc., and so on.

Production			Millions of Gross Tons					
Decade	Pig Iron	Increase*	Decade	Pig Iron	Estimated Increase	Decade	Pig Iron	Increase
Decade	Pig Iron	Per Cent	Decade	Pig Iron	Per Cent	Decade	Pig Iron	Per Cent
1832 to 1841	2.4	1	2024 to 2033	977.5	5.4	2134 to 2143	1,477.5	3.5
1842 to 1851	5.6	133	2034 to 2043	1,027.5	5.1	2144 to 2153	1,527.5	3.4
1852 to 1861	6.8	21	2044 to 2053	1,077.5	4.8	2154 to 2163	1,577.5	3.3
1862 to 1871	12.4	82	2054 to 2063	1,127.5	4.5	2164 to 2173	1,627.5	3.2
1872 to 1881	26.5	113	2064 to 2073	1,177.5	4.4	2174 to 2183	1,677.5	3.1
1882 to 1891	61.0	148	2074 to 2083	1,227.5	4.2	2184 to 2193	1,727.5	3
1892 to 1901	105.7	73	2084 to 2093	1,277.5	4.1	2194 to 2203	1,777.5	2.9
1902 to 1911	219.1	107	2094 to 2103	1,327.5	3.9	2204 to 2213	1,827.5	2.8
1912 to 1923†	388.3	75	2104 to 2113	1,377.5	3.8	2214 to 2223	1,877.5	2.7
The century....	822.8		2114 to 2123	1,427.5	3.6	2224 to 2233	1,927.5	2.7
				12,070.0			17,025.0	
				21,726			30,645	

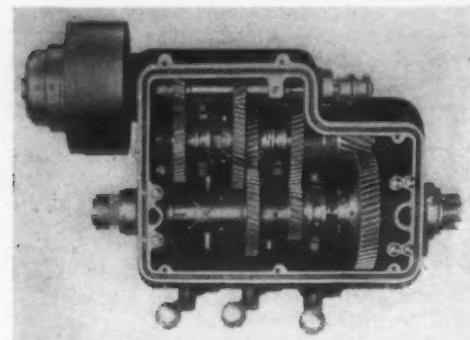
*Over previous decade. †Twelve years.
Total pig iron in 300 years, 1924 to 2223, 36,097,500,000 tons.
Total iron ore to correspond, 64,975,500,000 tons.

Geared Head Lathe with Helical Gears

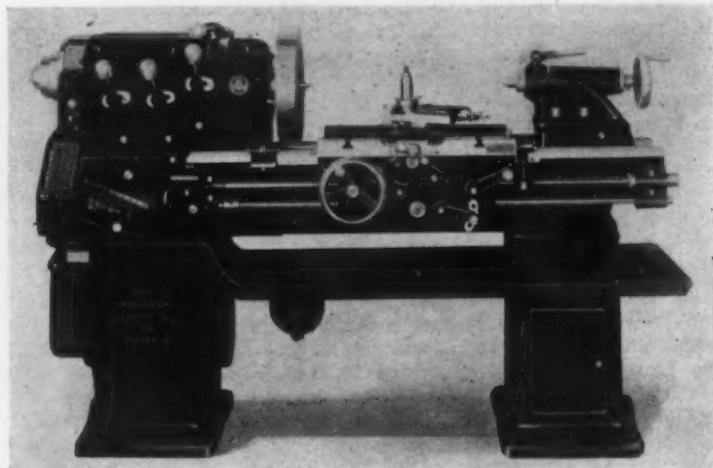
The new geared-head motor driven engine lathe equipped with helical gears, developed by the Monarch Machine Tool Co., Sidney, Ohio, and demonstrated at recent exhibitions of machine tools is shown in the accompanying illustrations.

The lathe is available in sizes from 14 to 30 in. The helical gears are the outstanding feature of the headstock and are always in mesh. Eight spindle speeds are available, changes being made with three levers which operate heavy double jaw clutches, the moving members of which slide on square sections of the spindle and intermediate shaft. Spindle speeds are selective and changes may be made with the lathe running.

The gears are of alloy steel drop forgings. Auxiliary shafts are mounted in double row combined radial and thrust ball bearings, and thrust developed by the helical gears is taken against ball thrust bearings.



Helical Gears Are Employed in the Headstock, the Arrangement of Which May Be Noted from View Above. Auxiliary shafts are mounted in ball bearings. There are eight spindle speeds. The 16 in. x 6 ft. self-contained motor-driven lathe is shown at right



The spindle bearings are of bronze and the end thrust is also taken against heavy ball thrust bearings. The headstock is oil tight and all gears dip in oil. There are no gears in the top cover plate.

The machine is motor driven, the motor being mounted on the headstock, attached to the headstock leg or inclosed in the headstock leg, as desired. The motor drives a friction clutch pulley on the back shaft. The friction driving clutch is of the multiple-disk type and may be arranged for control at the headstock in apron. There is but one point of adjustment for the driving clutch, this being made conveniently from the outside. The drive from the motor to the clutch pulley may be by means of endless belt with ball bearing adjustable idler, silent chain or gears. For the 14-in. lathe, a 2 to 3-hp., 1150-r.p.m. motor is recommended. With the speed of the driving pulley at 345 r.p.m., the spindle speeds range from 13 to 311 r.p.m.

The swing of the 14-in. lathe is 14½ in. over the bed and 9¾ in. over the carriage. The hole through the spindle is 1 9/16 in. and the taper of centers is No. 4 Morse. A range of feeds from 7½ to 115 per in. and a range of threads from 3 to 46 per in. is provided by the quick change gear box.

The Paulson Tool Co., South Cherry Street, Wallingford, Conn., is in full operation. For a short time heretofore the company's machine shop had been operating. Full operation was detained by construction of its new plant. The company has sufficient orders on its books to insure full time for several months.

The Ames Sword Co., Chicopee, Mass., heretofore on a three day a week schedule, is to increase its schedule to five days per week.

Youngstown Mills Resist Downward Price Tendency

YOUNGSTOWN, Nov. 2.—Sheet makers in this district are securing more business from buyers located in this and adjacent territory than formerly, owing to the short freight haul from mill to point of consumption. In many cases, the lighter steel products are being transported by motor truck. Fabricating interests which have been in the habit of placing some of their steel requirements with makers in competitive districts are now doing most of their buying locally, thus securing the benefit of the lowest delivered price.

In this district, steel makers are endeavoring to resist the downward price tendency in bars, plates and shapes, with some degree of success. Merchant bars, for instance, are ranging from 1.90c to 2c per lb., with producers in most instances holding out for the 2c quotation. On steel plates, 1.80c is said to represent the lowest price by district interests, which complain that

Eastern mills have recently quoted as low as 1.60c. in close competition for tonnage. Valley mills claim to be securing prices ranging perhaps \$2 a ton higher than prevailing minimums on these products.

President James A. Campbell of the Youngstown Sheet & Tube Co. states that in some finished steel lines prices are too low and makers are losing on such production. In attempting to hold business in consuming districts somewhat removed from the Valleys, by equalizing freight charges, the loss sometimes amounts to as much as \$3 and \$4 per ton. In view of the low earnings of steel companies generally, there is no disposition to continue a practice of this kind.

Broader operations and larger production, of course, will mean smaller overhead charges per ton of output.

Future Meetings of Electrochemists

The spring meeting of the American Electrochemical Society will be held at Niagara Falls, April 24, 25 and 26, 1925. The headquarters will probably be at the new Hotel Niagara, which is expected to be finished by that date. The meeting next fall will probably be held at Chattanooga, Tenn.

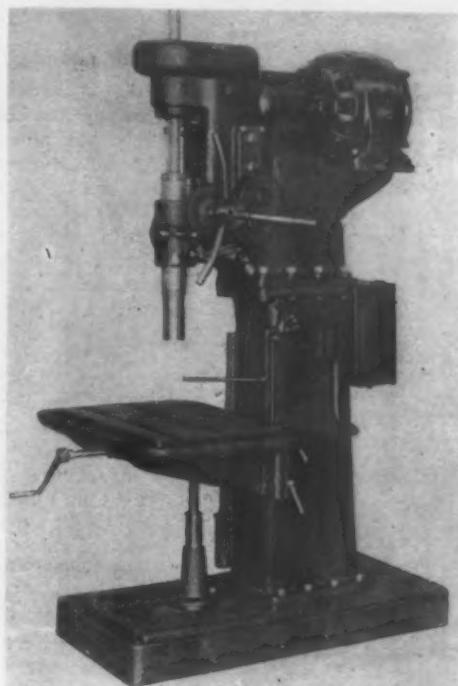
A symposium on fused electrolytes will be a feature of the Niagara Falls meeting and a symposium on nitrogen fixation is being arranged for the fall sessions.

Average operations of the Youngstown Sheet & Tube Co., Youngstown, embracing all of its properties, have been around 55 per cent, according to a statement by President James A. Campbell. In the Youngstown district, however, the company's average production has been on a relatively higher basis, and lower in the Chicago district, where extensive alterations and improvements have been going on.

Drilling and Tapping Machine for Production Work

A new 21-in. swing drilling and tapping machine shown by the Barnes Drill Co., Rockford, Ill., at the exhibition held recently in Milwaukee by the American Foundrymen's Association is illustrated herewith. It is designated as the No. 210 and is intended for use in quantity production work. The capacity is $\frac{3}{8}$ to 1 $\frac{1}{2}$ in. high-speed drills in solid steel.

The machine is a multi-purpose unit with speed



Self-Contained Drilling and Tapping Machine for Quantity Production of a Variety of Work

and feed set-ups for a variety of work. Take-off crown gears provide for speeds from 100 to 2000 revolutions and a wide range of feeds is made available by the use of slip gears. Geared thread leading feeds to pitch of tap may be provided for tapping work. The crown gears, which are of alloy steel, may be changed conveniently to provide faster or slower speeds, and the feed slip gears are located conveniently on the right-hand side of the machine.

Gears are of chrome-nickel steel throughout and important gears are heat treated. There are ten radial ball bearings of standard sizes for the gear shafts and crown gears, all of which are lubricated automatically.

The spindle is provided with six splines. Keys are not employed, and binding of the spindle in the crown gear when tapping or doing heavy work is said to be eliminated. The spindle is equipped with a roller thrust bearing having a double row of staggered short and long rollers. The drift hole is below the sleeve and a No. 4 or 5 Morse taper may be furnished as required.

The head is bolted to the box-type column, which construction is intended to provide for a raising block or longer column where greater distance is required between the spindle nose and table or base. The head is a unit in itself, containing all the working parts including the pump for the self-oiling system. The coolant pump is located at the base and driven by a vertical shaft inside of the column. The heads may be used conveniently in gang style.

The 5-hp. 1200-r.p.m. driving motor recommended is directly connected to the drive shaft by means of a flexible coupling. A clutch pulley, tight and loose pulleys, or quick change gear box may be provided in place of the motor. The star wheel handle, located on the right-hand side, as shown, and the company's internal

gear construction are incorporated, a leverage ratio of 1 to 35 being said to be available for hand feed or facing work. The table has a finished work surface of 28 x 17 in. It is gibbed to the column ways and may be clamped in any position.

The rack is attached to the sleeve by dovetail construction. A key takes the thrust, and set screws are not used. Patent application has been made for this feature. The counterbalance chain winds around the internal gear pinion shaft, facilitating quick return of the spindle. A safety device is provided to prevent overloading and minimize breakage of twist drills. The use of spur geared feeds instead of the usual worm and worm gear is claimed to reduce maintenance cost. Patents are pending covering spur gear feeds. The power feed may be engaged or disengaged while the spindle is running.

The distance from the face of the column to center of the spindle is 10 $\frac{1}{2}$ in. The maximum distance from table to nose of spindle, No. 4 taper, is 27 $\frac{1}{2}$ in. and to the base 39 $\frac{1}{2}$ in. The spindle travel is 12 in. The vertical travel of the table is 17 in. The floor space required is 34 x 48 in. The height of the machine is 75 in. The weight is 1920 lb. net, with 5-hp. motor and starter.

Improved Screw Thread Rolling Machines

A line of reciprocating screw thread rolling machines, incorporating improved features, has been placed on the market by the Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. Six sizes are available for rolling threads on screw blanks up to $\frac{5}{8}$ in. in diameter, and for threaded lengths on these diameters up to 4 in.

The machines are equipped with a hopper feed. The blanks pass from the hopper down an inclined



Screw Thread Rolling Machine with Individual Motor Drive

chute to the transfer mechanism, which carries them across to the entrance to the dies. Having the transfer mechanism and dies lie in the same angular plane as the feed chute is stressed as a feature which greatly simplifies the construction, the labor of setting-up, and the operation of the machines. The hopper is provided with a means for correctly locating the blanks in the feed chute. Upon reaching the space at the lower end of the feed chute, the blanks are held by suitable fingers on the transfer slide while they are being carried across to the die opening. The slide is actuated by a spring.

but is returned positively by means of a cam into position for receiving another blank.

The dies are rectangular pieces of hardened steel having thread grooves. One of the dies is held in a stationary die-block while the other is fastened to the gate which reciprocates at the feed chute angle. Dies of various heights to accommodate the required length of thread, up to the maximum for each size machine, are available. For short threaded lengths suitable filler plates are employed in the die pockets to locate the dies at the proper height.

As soon as a blank has been transferred to the die

opening, a spring pusher bears against the blank to assist in forcing it between the dies at the start of the downward stroke of the gate. The blank is thus pinched between the dies and the thread rolled on its shank during the downward stroke of the gate. At the extremity of the stroke the blank drops from between the dies into a trough and thence into a receptacle.

Machines may be arranged for belt drive from a countershaft, or with inclosed motor drive, as illustrated. The production of 150 blanks a minute is claimed for the smallest machine and 40 blanks a minute for the largest. Weights are 375 to 6700 lb.

Horizontal Disk Grinder Equipped for Wet Grinding

Charles H. Besly & Co., 118 North Clinton Street, Chicago, have placed on the market a No. 29H horizontal disk grinding machine equipped for wet grinding, as shown in the accompanying illustration.

The main base and pillow block bearing for the drive shaft are mounted on machined pads on the 4-in. high floor plate. In the center and at the bottom of the main base, which is of circular design, there is the lower radial and step bearing. On the side of the base is the drive shaft bearing which is a unit in itself. A large oil reservoir inside of the base contains a bevel gear and pinion of steel. An opening with oiltight cover in the side of the base permits access to the internal parts.

The top housing is of conical shape and has a solid web extending from the base to the outer edge. The central part has a circular opening machined to receive the top radial bearing. A circular perpendicular projection at the bottom of the cone serves as a partition between the outer edge and the central part of the housing, which leaves a circular opening under the grinding wheel, used as a suction chamber for exhausting grinding dust when dry grinding, and as a receiving drain when wet grinding.

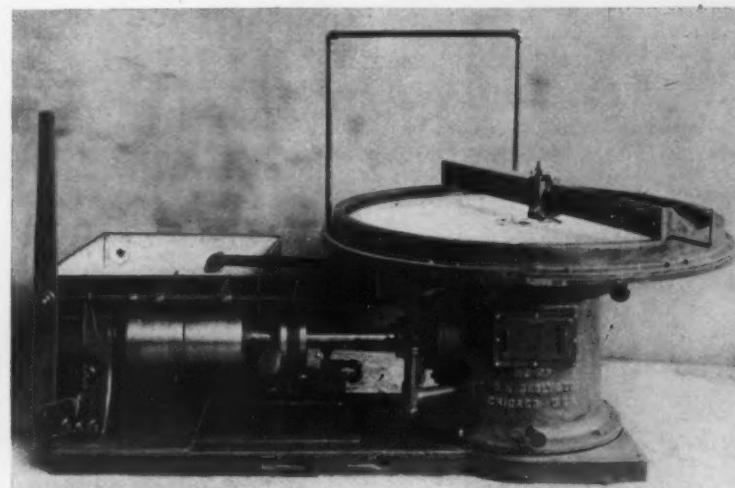
The spindle is 3 $\frac{3}{8}$ in. in diameter and 27 5/16 in. long, and is equipped with radial and step ball bearings. Bearings are mounted in removable housings and are adequately protected from dirt and grit. The wheel collar which carries the disk wheel is 10 in. in diameter and is shrunk on the top end of the spindle. The steel disk wheel is 53 in. in diameter and 1 $\frac{1}{4}$ in. thick. It is faced on both sides and grooved to provide maximum holding power for the cement used in attaching the heavy abrasive disks, which are made in quarters. For wet grinding the company's Redisc waterproof cement is used.

A circulating pump, piping and a three-compartment settling tank is provided for wet grinding. A guard ring secured to the upper housing serves to collect the water at the outer edge of the disk wheel, from which it returns to the settling tank. Spacing bars are secured to the guard ring to keep the work from moving with the disk. A jib crane with traveler and 1000-lb. chain hoist may be mounted on one side of the machine for removing disks and handling heavy work.

In the machine illustrated the hoist and spacing bars have been removed and a disk wheel truing device

mounted on the guard ring. This truing device is made up of a steel bar 4 in. wide and 1 in. thick with two angle brackets for attachment to the guard ring. A gibbed cross slide is mounted on the bar and fitted to traverse from center to outer edge of the grinding wheel. A vertical slide in the dresser has on its lower

end a bronze bearing into which is fitted the heat treated dresser cutter spindle. Large diameter Huntington type cutters are used and may be clamped rigidly in place on spindle, imparting motion to the spindle itself. The upper end of this slide is provided with a screw for feeding and holding the dressing cutters against the grinding disk. A draw rod attached to the lower part of the cross slide is for feeding the cutters across the face of the disk. The water is piped to the center of the wheel and spreads out over the face.



Disk Grinder Equipped for Wet Grinding. The wheel truing device is mounted on the guard ring as shown

Actual Stresses in Girder Hooks

In the case of mild-steel hooks having rectangular cross section, such as are often used for lifting heavy girders, it is not possible to tell by visual inspection whether any part of the hook has been stressed beyond the proportional or safe limit of the material. This is one of the important conclusions drawn by the Bureau of Standards as the result of thorough tests carried out on nine hooks in its laboratories.

At the critical section, in other words the section of the hook at which failure is most likely to occur, the actual stresses under a given load were higher with one exception than those given by the usual formulas. Certain special and more complicated formulas, however, give results which are correct. Since the observed stresses and the results as given by these more complex formulas are in no case more than 20 per cent greater than the stresses as computed by the ordinary formula, it is believed that if a sufficient factor of safety is employed, the usual formula will be safe to use for most work. At points other than the critical section, the ordinary formula gave values which agreed closely with the actual stresses observed in the tests.

The nine hooks employed in this work were supplied by the American Bridge Co., and loads of 5, 10 and 15 tons were used in the tests. The actual stresses were measured by an instrument known as a strain gage, which indicated the stretching of the material under load. The load required to stretch the metal a given amount was first determined by testing small samples cut from the hooks, in an ordinary testing machine.

Nitrogen in Steel—Prevention or Cure?

Its Removal Facilitated by Various Additions—Low Temperature Production of Iron in the Blast Furnace
Advocated as a Preventive

BY J. KENT SMITH

THE possible ill effect of nitrogen content in iron or steel has been a point quite neglected by the majority of metallurgists engaged in their manufacture, while it long has formed a subject of controversy among the relatively few who judged it worthy of attention. By these a vast amount of good work has been done and recorded, though the deductions from the results, referred as they have been to some determined gross nitrogen content, may have proved quite contradictory.

Correct determination of the amount of nitrogen in steel or iron is not lightly to be undertaken in the conditions of the industrial laboratory. Wherefore, the results of a given laboratory at best must be looked upon as comparative with themselves only, and not necessarily with those of other laboratories. Certainly in recent years much has been done toward the straightening out of determination kinks. A most excellent contribution to our knowledge on that subject has been made by Louis Jordin and F. E. Swindells of the U. S. Bureau of Standards.

Quantity Counts Less Than the Combination

Nitrogen may exist in steel or iron in different states of combination. One combination may be comparatively innocuous and another may be extremely deleterious, yet the amount of nitrogen itself may be identical. It is too much to expect the industrial laboratory to tell us the state of combination and disposition of such nitrogen as it finds. Its findings may usefully be backed by auxiliary microscopic examination, provided this be carried out at sufficiently high magnification. Such cases are not plentiful. A typical one may be found resulting from the fixation of residual nitrogen as zirconium nitride. The crux of the whole question is not "how much" but how that "much" is combined.

From the foregoing it is clearly evident that present clarification of our opinion as to the effect on iron or steel of nitrogen content must proceed from a general review of observed industrial facts and of such chemical facts as to nitrogen combinations as may be taken definitely to be proved, occasionally calling into the review absolutely comparative laboratory figures of nitrogen determination made on metal samples whose raw material source was identical. This research will involve standardization of present and development of selective methods of analysis; microscopic investigation at high magnification, with extensive exploration of selective etching methods; and possibly further incursion into the realms of pure chemistry.

Cyanogen Reaction in Blast Furnace

Obviously free molecular nitrogen does not enter directly into combination with iron, otherwise iron and steel made by any present-day process must be full of it. No reasonable doubt can exist that nitrogenization of iron is accomplished in the blast furnace via a "cyanogen reaction." It has been noted frequently that iron proceeding from a blast furnace making an undue quantity of cyanides or of cyanamide compounds "converts" into steel of poor physical attributes.

A possible reason for the undoubted mechanical superiority of cold-blast pig iron becomes a matter of intriguing speculation. Supporters of the total carbon theory are prone to consider that the matter settles itself entirely along these lines. Others contend that the proportion, more emulsified distribution, and dif-

ferent physical formation of the graphite give the reason. That both views have weight is hardly questionable, and that nitrogen content is a factor is also a matter of definite proof.

The very factors which lower the total carbon are identical with those which diminish the cyanogen compounds. And it is significant that one of the most striking attributes of a nitrogen-free steel is the ease with which sorbitic structure can be attained and retained. In other words, nitrogen-free ferrite would appear to offer much more resistance to the passage through it of carbides.

Nitrogen Removal by Additions

The ill effects of nitrogen in iron can be guarded against either by the removal of such nitrogen as is already contained, or by the prevention of nitrogen content in the first place. In the writer's opinion, nitrogenization of steel almost invariably is to be traced to the pig iron from which the steel, or the scrap which is a component of it, has been made. Nitrogen removal by means of additions cannot but be incomplete at the best, regulated as it is by circumstances of equilibrium determined by time, temperature and mass. In siderurgy the chief denitrogenizing elements are boron, titanium, vanadium and zirconium. Their resultant nitrides are partially removed to slag, and are fixed as to the remainder as comparatively harmless sonims in the steel or iron matrix.

Boron:—Consideration of boron as a practical denitrogenizing agent should be excluded. Its ability to form a eutectic of iron, carbon and boron, whose fusibility is well below the forging temperature of steel, makes it an exceedingly dangerous "medicine" for that metal. For similar reasons boron is not to be commended for adding to cast iron, since this eutectic is prone to form around the crystal boundary, thereby producing fragility and intergranular brittleness.

Titanium:—The effects of treating iron and steel with vanadium or with titanium have been voluminously recorded. There can be no doubt that a considerable proportion at least of the indirect toughening action due to treatment with vanadium results from removal or "fixation" of nitride contents. The same may be said of titanium treatment. However, distinct points of difference arise in the use of the two elements. Titanium is an extremely avid deoxidizer; wherefore its denitrogenizing effect is greatly influenced by the amount of deoxidizing which it has the opportunity of performing—while beyond its scavenging effect it cannot be expected to exert any further influence for good.

Vanadium:—On the other hand vanadium is a more eager denitrogenizer than a deoxidizer, and its scavenged products are removed in a fusible and thus readily separable form. Again, scavenging is only one of three functions which vanadium performs when used as a steel addition. Direct toughening through its solid solution, and strengthening through its becoming an essential component of the complex carbides, are the other two.

It is of extreme importance that in treating cast iron with either element, the "carbonless" form of its alloy be used. Otherwise the high dissociation points of their carbides at best render negative the performance of the alloy additions for good on account of insolubility. It is permissible to use carburetted titanium alloy as an addition to really hot steel; the use of carburetted vanadium alloys is never to be recommended.

Zirconium:—A good deal has been published con-

cerning the addition of zirconium to steel, though little or nothing with regard to its addition to cast iron. Some of the best work in the former direction has been published by F. M. Becket, vice-president Electro Metallurgical Corporation, New York. To that indefatigable worker the alloy industry owes more than it can repay. He received a well deserved honor when the Perkin Medal was conferred upon him this year.

Two facts of extreme interest emerge from Mr. Becket's work. The first is that the majority of such nitrogen as is left in the steel after zirconizing it remains fixed and in the form of sonims of bright yellow plate-like structure, visible only at high magnification. The second is that zirconized steels, even when unduly high in sulphur and extremely low in manganese ratio, roll perfectly. This fact is in striking accord with a recent observation of the writer, where a steel, whose freedom from nitrogen had been assured by preventive means, was deliberately sulphurized to 0.16 per cent, and though it contained only 0.28 per cent of manganese it cogged, forged and rolled without the least sign of disintegration or of "red shortness."

Crucible Steel with Swedish Base

Braune records that a steel with a perfectly normal content of the usually recognized impurities, but which was unduly high in nitrogen, had proved utterly unworkable in the forge. Thus there is the strong presumption that nitrogen may modify profoundly the fabrication properties of steel; and it is not illogical to conclude that service properties are also affected.

Some time ago the writer had under his direction a plant comprising both open-hearth and crucible installations. From the latter many hundreds of identical steel articles were turned out, which were put to severe service. Trial and error showed that for their successful preparation one of two particular brands of Swedish bar base steel gave the best results. The conventional analysis of these bars was rigorously copied on the open-hearth but the resulting bars (dead mild and extremely low in manganese), when used as a crucible base, did not give the service results attainable by the use of the Swedish base. A charge worked down on the open-hearth from the same raw materials was vanadized to the extent of 0.25 per cent. In spite of the fact that its manganese content was only 0.037 per cent the ingots rolled well to bars. These, cut up and used as crucible base, produced steels whose service value was fully comparable with those made from the Swedish base. As there were practically no carbides to strengthen the mild open-hearth product, and this was rigorously deoxidized previous to the vanadium addition, most of the work of the vanadium would be in the elimination or "fixation" of nitrogen.

Preventing the Entrance of Nitrogen

So far we have dealt with the removal of combined nitrogen already present. Obviously the more logical course to pursue would be to prevent its entrance. We can take it that, in ordinary blast furnace practice, this entrance is effected via a cyanogen reaction, the extent of which is dependent mainly upon a temperature factor, and the absorption of whose product by the descending particles of semi-melted or molten iron is a function of temperature, time and surface contact.

In Swedish blast furnace practice the combination of nitrogen with the metal product is minimized automatically. In the first place, the slag environment is such as to make for the production of less cyanogen compound, even under equal conditions of temperature, while the quantity made is further minimized by the fact that the hearth temperature is considerably lower in the charcoal furnace than in the coke furnace.

The detailed work of Professor Leffler of Stockholm shows that the space where the dropping particles of iron are submitted to contact with the gaseous products of the zone is much smaller in the charcoal furnace than in the coke furnace. And last, and

perhaps most important, such nitride as is acquired by the iron through absorption is to a large extent automatically fixed. The best grades of Swedish ore contain large quantities of vanadium oxide. This is partially or entirely reduced in the hottest zone of the furnace and the resultant—being more avid for nitrogen than is iron—either prevents absorption, or fixes such nitride as has already been absorbed by the iron as a comparatively innocuous sonim.

Shortcomings of the Blast Furnace Product

The blast furnace as we now know it had its crude beginnings (some 700 years ago) in an attempt to industrialize on a larger scale the catalan forge, and was not designed for the production of what we now know as cast iron. Consequently its product came as a severe shock to the ironworker of the period. He had been accustomed to his iron being weldable, malleable and tenacious. The product of the first blast furnace was (and of the present highly developed instrument is) un-weldable, non-malleable, and more or less brittle. We know it now not to be simple iron but rather an alloy of iron with those components which have been reduced in the hotter zones of the furnace subsequent to actual iron reduction and previous to or concurrent with its melting—in other words, to be an alloy of iron with the products of its blast furnace environment.

Subsequent to the arrival of the blast furnace, which greatly increased unit output, the efforts of the ironworker were concerned with the removal of the impurities which had been put into the iron subsequent to reduction. Had carbon, silicon, sulphur and phosphorus been the only impurities put in, his efforts at complete restoration of old attributes would have been entirely successful. Unfortunately, nitride compounds, once introduced, are not removed subsequently in every day common practice though they may be to a reasonable extent by the procedures previously indicated.

Low Temperature Iron Avoids Nitrogen

The marked superiority in the fundamental attributes of ancient irons and steels—usually described as the "classic" irons and steels—to present-day irons and steels is generally admitted. With successive endeavors to accommodate iron and steel production to the growing needs of quantity production and of financial economy, we departed further and further from the practice of those principles upon which were dependent the manufacture of the classic irons.

The author has predicted for years that steel manufactured from iron produced at low temperature would show a sharp reversion to original type, since, in the process of low-temperature production, the iron would not be nitrogenized in the first place. He recently had entrusted to him for conversion to steel, several tons of iron produced (from a common ore) by the latest low-temperature method, and the physical attributes of the steels fully confirmed his most sanguine expectations.

One of Sheffield's shrewdest iron masters set forth the analogy that a piece of iron resembled a human life, in that most of the disabilities of its later years were to be traced to the faults of its early youth or to defects born with it. In other words, he declared that if a piece of steel failed in performance from lack of stamina and virility, the cause—always provided that good practice has prevailed at intervening stages—must be looked for in the blast furnace itself. What has been said above substantiates that view and, by observation and deduction, nitrogen combined with iron reveals itself as the hitherto "hidden hand."

Fluxstone shipments in 1924 of the Bessemer Lime-stone & Cement Co., Bessemer, Pa., will fall below 1923, directors were informed at a meeting in Youngstown, Ohio, last week, because of the low rate of blast furnace operations in midsummer. While cement shipments are currently running at a higher rate than last year, the aggregate this year will be about the same as last.

Welding Would Abolish Noise Nuisance

Advantages of New Method in Building Construction Discussed by Speakers at Cleveland Meeting of American Welding Society—Further Research and Competent Welders Necessary

WELDING as a substitute for riveting in building construction work was discussed at length in all its phases at the fifth fall meeting of the American Welding Society held at the Hotel Winton, Cleveland, Oct. 30 and 31.

Two technical sessions were held and these were confined almost entirely to the one subject with papers covering three branches of the industry, arc, gas and spot welding. Various speakers showed that much progress has been made in welding steel buildings, but that there is much development work to be done in this branch of the welding industry. The viewpoint of structural steel engineers on the welding of steel buildings was also obtained during the discussion.

The opening session Thursday was presided over by H. H. Dyer, chairman of the Cleveland section, who spoke of the rapid development of the welding industry in the past ten or 12 years, but declared that the surface had hardly been touched in this field. E. H. Ewertz, Bethlehem Shipbuilding Corporation, who is president of the society, said in a brief talk that if it could give structural engineers means for welding instead of riveting buildings so that 25 per cent of the steel would be saved and a stronger structure provided, it would be accomplishing a great deal, although investigation in that field is only one of the society's activities.

Gas Welding and Cutting in Structural Field

"Ox-Welding and Cutting in the Structural Field" was the subject of a paper by G. O. Carter, Linde Air Products Co. The speaker referred to the extensive use of oxy-acetylene cutting in building bridge and tank work and emphasized the advantages of the oxy-acetylene welding process for maintenance and repair work. Some, he said, have realized the possibilities of cutting beams, angles and plates as a tailor would cut cloth. He mentioned as interesting examples of the use of oxy-acetylene cutting and welding equipment the construction of cabooses in a steel plant where only one or two were needed, for which it would have hardly paid to make detailed drawings and to lay out templates. He also spoke of the construction by a steel company of several large buildings with stock and second-hand beams. With only the drawings at hand, the engineers cut the sections to length and drilled the bolt holes with the oxy-acetylene flame.

A great problem in the structural field at the present time, according to the author, is the possibility of making a welded joint instead of a riveted joint. He does not question that a properly made oxy-acetylene weld is the best joint that can be made and the problem before structural engineers is a proper design of structural members for welded buildings. As long as rivets are used, flat sections will be used. Many years ago, tubular columns were used on the theory that, with length limitations, they were the strongest for a like weight. However, tubular construction in frame buildings was generally abandoned because of the difficulties in riveting. The advent of oxy-acetylene welding has brought about a change, and within the past four or five years some shop buildings, warehouses and garages have been built with pipe welded together for all the important members. The author referred to the fact that the Army Air Service has adopted tubular members welded at the joints as standard construction for air craft fuselages. Naturally there must be some engineering study of the strength of the columns, of the truss design, etc., so that there will be ample strength, and at the same time full advantage be taken of the welded tubular construction.

Following the present designs with flat members, fullest advantage is not taken of the strength of the

material or of the welding process. If a lap weld or tack welds are substituted for riveting, there is a small saving, but with an improvement in design permitted by the use of tubular construction with the welded joint, there is a saving in weight with less expensive fabricating operations.

One of the important problems in welding structural work has been the supply of competent welders and on that account large contractors have been slow in considering welding. However, several big welding organizations have been brought together on pipe line work during the last two or three years and the principles of organization of a welding gang have been thoroughly developed. He referred in this connection to a pipe line 220 miles long that had been welded in Texas. The speaker contended that there is nothing mysterious in making every oxy-acetylene weld good. To be up to the strength of the material, the weld should be made from two sides with filler material of a quality equal to that of the steel that is being used.

The use of bronze filler-rods in place of steel filler-rods in steel construction was discussed by Mr. Carter. A flux is used for applying the bronze to the butting edges of the steel and then the space is filled in with bronze. The use of the bronze filler-rod instead of steel reduces the heat effect on the structural shapes permits the filler material to be deposited faster, and affects a saving in the gases. He estimated that with the increased speed resulting from the use of the bronze rod the welding costs can be reduced one-half. The strength of the joint is high, welds made from one side being practically as strong as similar welds made with the Norway iron filler material. The use of the bronze filler material was also recommended on lapping edges.

In the discussion of the paper, Mr. Carter said that before the flux used with bronze filler is applied, the metal is brought to a red heat and that the bronze filler will cut the cost of welding by making it possible to do the welding so much faster. He suggested that a start be made with certain parts instead of trying to weld an entire building and that test data of jobs should be provided. Asked if he could design a four-story building for welding without tests, Mr. Carter replied that he could not and would prefer to confine his activities to smaller buildings. One speaker thought that more would be accomplished in a short time by using present structural members rather than adopting tubular members.

Advantages of Arc Welding in Large Structures

"Electric Arc Welding as a Method of Fabricating Large Structures," a paper by W. Spraragen, secretary of the Division of Engineering of the National Research Council, American Bureau of Welding, by W. L. Warner, General Electric Co. and H. Goldmark, was read by Mr. Spraragen. The various advantages of welding as compared with riveting in building work were outlined. It was said that there would be a saving in weight of the steel, the drawings would be simpler, making of templates and punching holes would be eliminated, there would be a freedom of alignment in making joints that is not possible in a riveted job, erection is easier and the noise of riveting, which was regarded as an important factor, is eliminated. Engineers must be convinced by two kinds of test, those from buildings already constructed and with laboratory tests. So far buildings that are welded have been built from designs for riveting. Structural engineers look with suspicion on welds for carrying high loads. There are no reliable figures showing the comparative costs of the two methods.

H. L. Whittemore, Bureau of Standards, spoke briefly, expressing the belief that the tonnage of steel

used can be reduced by the welding process, and that it is the cheapest and quickest method of steel building construction. However, he declared that there are several metallurgical problems to be worked out. Data must be gathered on fatigue and strength of joints and this will necessitate considerable research.

Mr. Warner showed a number of lantern slides illustrating arc-welded structural steel building trusses, types of welded joints, a riveted railroad bridge truss and the same truss redesigned for welding, and presented various welding details with considerable test data relating to building work. He said he could not tell whether tubular or flat shapes would be cheaper until full data are available.

Rivets a Known Quantity

L. A. Miller, of the American Institute of Steel Construction, said that the structural engineer knows what rivets can do and wants to be shown what welding will do. "Rivets have never failed," he declared. "We deal with steel under stress and want to know what stresses welding will take care of. We want to reduce costs. Lots of building work such as joining base plates to columns can be welded and a start can be made with work of that kind. If every member must be tested, this will cost more than to make the joint. You have got to know more about stresses before you get anywhere."

Mr. Ewertz remarked that they would not get very far until the welding and structural men work together. J. H. Edwards, American Bridge Co., said that his company had done lots of testing with riveting and spot welding and he was satisfied that a spot weld can be made as good as riveting, but it is up to the welding industry to show that a saving would result in the entire process. The structural people are willing to co-operate and to adopt any method that is more economical. In his opinion it will be best to continue to use the present standard structural members, but as the value of the welding processes is proved new structural shapes will be developed that will be more suitable for welding.

Use of Spot Welding Increasing

"Uses of Spot Welding in the Structural Field" was the subject of a paper by H. A. Woofter, Thomson Electric Welding Co., Lynn, Mass., who showed lantern slides of the latest types of spot welders. He said that the use of spot welding for structural work is increasing and among its advantages are greater strength and increased production. One of its latest applications mentioned was the welding of building joists with improved types of machines. Reasons that formerly existed for not using spot welders no longer exist. Two types of machines can be used in the building field, one for shop work and a portable machine for field work. If there is a demand for larger spot welders for structural work, it will be easy to make larger machines.

The loosening of rivets was discussed by R. Kinkead, Lincoln Electric Co., Cleveland. He declared that structural steel can be welded at one-third of the cost of riveting and pointed out that a disadvantage of riveted joints is that the rivets work loose. When a rivet does not fill the hole, water or atmospheric moisture will work in and finally cause the loosening. Millions are spent every year, he said, to maintain structures on which rivets get loose. With certain limitations, welded joints will fill all requirements. Failure of a welded joint is due to not knowing how to weld. The speaker told of tests he had made with rubber to get a physical conception of what goes on in a riveted joint.

Inspection Trip

One afternoon was spent in an inspection trip to the shops of the New York Central Railroad where some welding is being done in repair work, to the plant of the Lincoln Electric Co., where production work on motors and other equipment is being done with arc welders and to the high-pressure pipe line that is being laid by the Cleveland Electric Illuminating Co. This is a 16-in. 500 lb. pressure line that will be 5000 ft. in length, the joints of which are being gas welded.

The program included two luncheon meetings, a dinner Thursday evening and an interesting program Friday evening. The latter consisted of a four-reel motion picture film presented by F. E. Rogers, Air Reduction Sales Co., showing how liquid air is made, how the high temperature of the oxy-acetylene flame is produced and how the oxy-acetylene torch is adapted to mechanical cutting and welding. Mr. Rogers also gave a liquid oxygen demonstration. T. A. Wry, General Electric Co., showed by means of a projector what happens in metallic arc welding. An actual demonstration of a thermit weld was made by R. L. Browne, Metal & Thermit Corporation.

American Participation in British Machinery Exhibition of 1925

At a luncheon given by F. W. Bridges, organizer and general manager of the Shipping, Engineering and Machinery Exhibition to be held Nov. 3 to Dec. 5, 1925, at Olympia, London, England, the participation of American machinery and equipment manufacturers in that exhibition was invited. More than 30 guests were at the luncheon, which was held Oct. 30, at the Machinery Club, New York. Calvin W. Rice, secretary American Society of Mechanical Engineers, and F. D. Herbert, Kearnott Engineering Co., Inc., New York, were among those who spoke in favor of the project.

The exhibit incorporates the Yacht, Boat and Marine Motor Exhibition, and the space available is estimated at 328,000 sq. ft. The honorary president is Sir Charles A. Parsons, and the patrons include well known British engineering interests and 35 societies and associations. The purely commercial character of the exhibits and the success of past expositions, the first of which was given 20 years ago, were emphasized by Mr. Bridges.

Resolutions were passed to the effect that for the development of export trade it is desirable that an American section be formed at the 1925 Olympia exhibit. Another resolution favored the formation of an American committee of cooperation. It was also decided that various institutions and societies in the United States connected with the shipping, shipbuilding and engineering industries be asked to consent to the proposed American section being held under their auspices and that leading men in industries represented by the exhibition be invited to become patrons of the American section. Arrangements for representation may be made through the General Expositions Co., 111 East Forty-second Street, New York.

L. E. Riddle Heads Blast Furnace and Coke Oven Association

L. E. Riddle, general superintendent City Blast Furnaces, Carnegie Steel Co., Pittsburgh, is president of the Eastern States Blast Furnace and Coke Oven Association which now has a membership of 170 active coke oven and blast furnace operators and designers. Dan M. Rugg, superintendent of the Donner-Hanna Coke Corporation, Buffalo, who served as secretary during the 1923-24 term, has been elected vice-president and H. E. McDonnell, superintendent of blast furnaces, Weirton Steel Co., Weirton, W. Va., has been elected secretary. The new president has been identified with the Carnegie Steel Co., except for a brief period at the laboratory of the Shoenberger Works, American Steel & Wire Co., since 1893. His first position was in the laboratory of the Isabella furnaces, Etna, Pa., and since has been successively assistant chief chemist, hot blast man, blower, general foreman, superintendent of Isabella furnaces, and succeeded, upon the death of J. P. Collins, to the position of general superintendent of the City Blast Furnaces, which include the Isabella, Lucy, Neville and Edith furnaces. The first application of dry blast to a blast furnace was made while Mr. Riddle was general foreman at Isabella furnaces.

IMPROVEMENT EXPECTED

Youngstown Manufacturers Looking Forward Confidently to Better Business

YOUNGSTOWN, Nov. 3.—In announcing operating schedules for this week, managers of district iron and steel properties predicted a broader production rate before the week ends, provided the national election result is a satisfactory one. Larger business will be followed by firmer steel prices, they predict. Early response to a favorable national election result is freely prophesied, with substantial tonnages held in abeyance until the result is determined.

The release, as suggested, of business in considerable volume is expected to have an appreciable effect upon the market. Forward buying is looked for by jobbers and manufacturing consumers. The latter, especially, have been holding buying to actual requirements for some time, sufficient to maintain operation of their properties.

Indicating its faith in the immediate future of the demand, is the action of the Youngstown Sheet & Tube Co. in lighting the last idle blast furnace in its East Youngstown group of four stacks. The furnace started to produce iron during the early part of this week, following a suspension of several months, during which it was relined and its capacity enlarged.

With this acquisition to its active stacks, the Sheet & Tube company is now operating five of nine blast furnaces in its groups at Youngstown. This resumption gives the district 21 active blast furnaces, of 45, the active furnaces representing capacity in excess of 55 per cent of the total.

The Sheet & Tube company has completed eight new sheet mills at its Brier Hill plant, increasing the total number of such units in the Mahoning Valley to 127. The Republic Iron & Steel Co. has likewise completed a new butt-weld tube mill which has been under construction since early in the summer. This additional unit gives the Republic company seven pipe mills, of which four are butt-weld units and three lap-weld.

Proposed Increased Rate on Pig Iron Is Suspended

WASHINGTON, Nov. 3.—The Interstate Commerce Commission last Friday announced that it had ordered suspended from Nov. 1 to March 1 the operation of schedules proposing to increase the rates on pig iron from Chicago, Peoria, Springfield and related groups in Illinois, also St. Louis and Prairie du Chien, Wis., to destinations in Iowa territory. Typical of the schedules are those applying to rates to Cedar Rapids, Iowa, which it is proposed to increase from \$2.31 to \$2.80 per gross ton from Chicago and from \$2.31 to \$3.04 from Springfield.

Proposed Schedule of Wire Product Rates Not Justified

WASHINGTON, Nov. 3.—Holding that they were not justified, the Interstate Commerce Commission, in a decision last week, ordered canceled schedules which proposed the elimination of wire, nails and staples from the list of iron and steel articles, in carloads, from St. Louis and other defined territories and from Shreveport, La., to Texas, Oklahoma and New Mexico points, and between points in Texas on interstate commerce. The schedules had been filed by the railroads to become effective June 22, 1924, but subsequently were suspended pending hearings and investigation. Protests were made by numerous shippers, including iron and steel interests. In its decision the commission said the proposed elimination of wire, nails and staples from the commodity items in issue would result in materially increased charges on shipments of iron and steel articles containing more than 300 lb. of wire, nails and staples.

The protestants stated that the proposed mixture of only 500 lb. of nails would be of no value, as the quantity is wholly insufficient to meet commercial needs. The railroads claimed that the tariffs had been filed so as to make tariffs in the Southwestern territory uniform as to descriptions and that the proposed schedules represented one of the first steps in that direction.

Those protesting against the schedules stressed the point that the railroads have made no attempt to justify the elimination of wire, nails and staples from the list of iron and steel articles from the standpoint of their revenues under the rates in issue. They also directed attention to respondent's unfamiliarity with the mixtures that are now being moved to Texas points under the suspended schedules, indicating that the peculiar transportation characteristics of wire, nails and staples could not have been the motive for the changes proposed.

Mill Operations Slightly Increased

YOUNGSTOWN, Nov. 3.—This week but 61 sheet mills were originally scheduled, though makers stated such production would likely be enlarged before the end of the week. Both the Falcon Steel Co. and the Mahoning Valley Steel Co. decided to allow their plants to remain inactive until after Tuesday, at least.

The Sheet & Tube company added another tube mill to its active units, making a total of 12 active, of 18.

Two of four plate mills are rolling and hot strip mills are running close to normal. Bar mill operations average perhaps 75 per cent. The Carnegie Steel Co. is operating 17 mills divided between its McDonald and Union works, the Republic company has on four mills and the Sheet & Tube company its 9-in. unit.

The Trumbull Steel Co. is operating 19 of 29 tin mills, the Falcon Tin Plate Co., four, while district capacity of the American Sheet & Tin Plate Co. is engaged at 75 per cent.

Steel ingot output in the Mahoning Valley is being maintained at 70 per cent. The independents are operating 31 of 52 open-hearth furnaces, while all four Bessemer departments are in commission, but at a reduced rate.

The principal fabricating interests are averaging 75 to 80 per cent in this territory.

Most Powerful Locomotive Ordered by Southern Pacific

What is referred to as the largest and most powerful non-articulated locomotive ever built, has been ordered by the Southern Pacific System from the American Locomotive Co. It is a three-cylinder and has a tractive power of approximately 90,000 lb., and a 4-10-2 wheel arrangement. Being the first of this type built in the United States, it will be known as the "Southern Pacific" type.

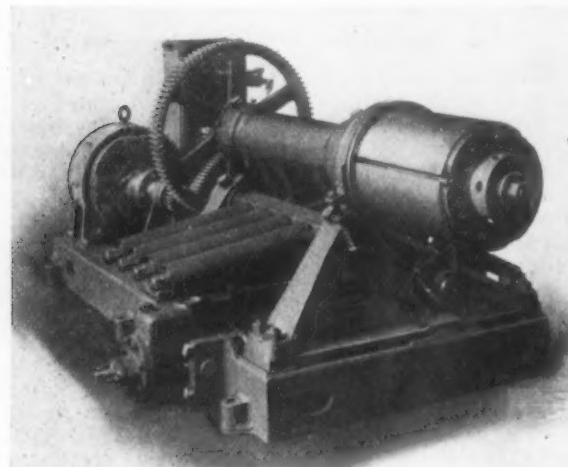
Several months ago the Southern Pacific System purchased 10 large "Mountain" type locomotives from the American Locomotive Co. In the summer tourist season, ten sections of the Sunset Limited and Golden State Limited were operated between Los Angeles and El Paso, a distance of 815 miles. Previously four locomotives had been required for each train on this run, a total of 40 locomotives being used to handle the ten trains. With the new "Mountain" type, each train was handled on time with one locomotive and without the changing of engines.

One mishap marred the record of the Carnegie Steel Co. in the Youngstown district in October, preventing it from showing a "No Accident" report. However, officials are gratified at the showing, stating that safety educational propaganda and cooperation on the part of the workmen are producing beneficial results. In this district, the Carnegie company employs under normal conditions a total of 7500 workers at its various properties.

New Reel for Coiling Cold Rolled Strips

The controlled tension reel which has been placed upon the market by the United Engineering & Foundry Co., Pittsburgh, and for which a patent is pending, will, it is claimed, overcome the difficulties which producers of cold rolled strip steel and other metals have had in securing coils tightly and evenly wound.

The reel, which is shown in the accompanying illustration, is placed behind the mill. As soon as sufficient strip has come from between the mill rolls for the operator to grip it, he inserts the end into the jaws of the reel, which automatically grip the strip and commence to coil it when the operator depresses a foot treadle. As it is necessary that the strip be coiled tightly and evenly, the reel head is arranged to revolve more quickly



Controlled Tension Strip Reel Claimed to Produce Tightly and Evenly Wound Coils

at first to take up the slack and then reduce speed to synchronize the winding of the strip with the speed of the rolls, at the same time maintaining a suitable tension on the strip to wind it tightly and uniformly, without undue stretching or breaking.

The reel head and drive shaft of the device are carried by a swinging yoke, which is held in its position farthest from the mill by a nest of springs. As the high starting speed of the drum gains on the strip the drum or reel head is drawn toward the mill by the coiling of the strip, and the springs are compressed by the increasing tension until the desired tension on the strip is reached. At this point the motor slows down automatically so that the speed of coiling synchronizes with the speed of the rolls and even tension is maintained on the strip to the latter end. A magnetic clutch is provided to permit stopping and starting of the reel without stopping the motor. Several of these reels are in operation or under construction for the Illinois Zinc Co., which has had one operating for several months.

Stamped and Enameling Ware

Production of 329 establishments engaged in stamping and enameling sheet metal goods is reported by the Census Bureau for 1923 to have amounted to \$170,923,386, compared with \$100,585,381 from 324 establishments in 1921. The wage earners increased from 24,192 to 35,237, and their wages from \$26,862,380 to \$42,635,592. Horsepower used in 1923 was 69,131, while the coal consumed amounted to 284,900 net tons.

John O. Oartel, chief of the safety department of the Carnegie Steel Co., Pittsburgh, conducted the second of the series of lectures in the industrial safety course in the Hutchinson High School, Buffalo. More than 2200 persons are registered in this course and 359 industrial organizations of this district are represented.

Quad-City Foundrymen's Meeting

L. A. Hartley, director of education National Founders' Association, Chicago, gave an address on continuation schools at the October meeting of the Quad-City Foundrymen's Association held at the Rock Island Club, Rock Island, Ill., Oct. 27. He pointed out the necessity of education for a large percentage of our young men and women who leave school to go to work, either by choice or necessity. These young people, he said, should be taught a vocation or given a training while working, which is supplemented by such school work as is necessary to make them better citizens and useful members of the community.

A. E. McClintock, commissioner National Founders' Association, also gave a brief talk on the nation-wide necessity for industrial education, not only to keep industries up to the highest point of efficiency on account of foreign competition, but also because of the immigration restrictions. He asserted that a number of cities, including York, Pa., Milwaukee, and Fitchburg, Mass., through their school systems in cooperation with their factories have directed young men and women into useful and productive occupations. For the success of any of these apprenticeship or training courses, there must be uniformity of curriculum in the various plants with a systematically and well organized staff of instructors under one directing head, whose duty it is to see that the students get such necessary shop training and school work as the courses demand. It has been demonstrated that the three-year course of this kind materially improves the earning capacity of the student. The Quad-City Foundrymen's Association has studied the apprenticeship problem for the past two years and in the near future will inaugurate a plan for apprenticeship training in Moline, East Moline, Rock Island, Ill., and Davenport, Iowa.

Reparation Is Awarded New England Drawn Steel Co.

WASHINGTON, Nov. 3.—Passing upon a complaint of the New England Drawn Steel Co., Mansfield, Mass., the Interstate Commerce Commission last week handed down a decision holding that rates charged on rods, in coils, in carloads, from Pittsburgh and Johnstown, Pa., from Buffalo, and from points taking the same rates from Mansfield, have been found inapplicable. Reparation was awarded.

The complainant charged that since Jan 1, 1918, the railroads charged the full fifth class rates, although there were and are commodity rates in effect. The question arose as to whether the shipments consisted of bars in coils or rods in coils. Steel bars in carloads, it was pointed out, are rated substantially as fifth class, minimum 36,000 lb. Rates on "unfinished" rods in coils approximate the sixth class rates, and the minimum is 56,000 lb.

The Commission held that the shipments were "unfinished" in the sense that the material was used for manufacturing wire and the records showed that the steel coils were not drawn through a die, were not lighter than No. 8 gage or greater than 1 1/4 in. in diameter and were actually transported in open cars without loss or damage of any kind. It was therefore found that commodity rates were applicable instead of the fifth class rates.

Railroad traffic established a new record in the week ended Oct. 18, with car loadings of 1,102,336, compared with the previous record of 1,097,493 cars in the week of Sept. 29, 1923. For 1924 up to Oct. 18, the total is 38,970,818 cars. This exceeds the figure for any previous year, with the exception of 1923, which showed 40,542,048 cars.

Fire, Oct. 29, destroyed the Caledonia compressor plant of the Shawmut Mining Co., St. Mary's, Pa., with a loss of \$50,000. No plans for rebuilding have been made.

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ESTABLISHED 1855

THE IRON AGE

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A Better Steel Year at the End

THE prophecies leaders in the steel trade made at the recent meeting of the American Iron and Steel Institute in New York were favorable without exception. All were qualified by references to election possibilities, but in respect to these the reservation really amounted to saying that no election result is sure until there is an actual announcement of the count of the vote. Under such an interpretation of what was said by Judge Gary and by heads of independent companies, all may be fairly put down as of the belief that the improvement noticed in the steel trade in recent months will be maintained and may go further.

The Steel Corporation's order books, as Judge Gary indicated in his address, showed a gain in each month following May—2000 tons more a day in June than in May, and then successive gains of 6000 tons a day in July, 10,000 tons a day in August, and 6000 tons a day in September. He added that in the first seventeen days of October the bookings were about 5000 tons a day more than in the first seventeen days of September. That does not mean necessarily that October bookings throughout averaged that much more than those of September. The probabilities are that the un-filled orders on Oct. 31, as published next week, will show that they did not, for September bookings—due to large rail and car steel orders and to the sheet bar contracts for fourth quarter that went on the books just before Oct. 1—were much larger in the second half than in the first half.

The significant fact, however, is that the steel trade is coming into the last two months in the year under much better conditions than were looked for two months ago. Production of pig iron and of steel ingots is increasing more rapidly than was expected when September opened. October pig iron production, as shown in our blast furnace statement, was 20 per cent greater than that of September, and steel ingot production, when published next week, doubtless will represent a like notable gain.

Indications now are that the 1924 steel output will be not far from 36,000,000 tons of ingots.

That is a considerable falling off from the 43,485,000 tons of 1923, but an unexpected advance over 34,370,000 tons, which was the average for the five post-war years 1919-1923. Thus, on the score of activity, and contrary to the general prediction, 1924 will turn out to be not a poor year after all.

Steel Mills as Consumers

SHOULD steel manufacturers aim to fabricate or work up their rolled and other products into goods for final consumption, or should they avoid such manufacturing operations, as being in essence a competition with their natural customers, often called by the general term "manufacturing consumers?" Some mills have pursued the former policy to an extent, but the preponderating idea has been to keep away from it.

The interesting question now arises whether the destruction of the remains of the Pittsburgh plus system and the setting up of district steel prices will have an influence to alter this policy.

To those familiar with the history of the American steel industry and the personnel of those now engaged in it, it goes without saying that the steel companies will expand if they possibly can. It is their nature to do so. It may be considered a question of vertical or horizontal expansion. It resembles the horizontal and vertical integrations a quarter century or so ago. There was horizontal integration in the formation of the wire, tin plate, sheet, pipe and other "combines," and vertical integration in the formation of the United States Steel Corporation.

Then among independents there was a period of the independent steel maker becoming "self-supporting," acquiring blast furnaces, iron mines and coke ovens.

From this viewpoint the idea of the steel mill becoming a manufacturer of finished wares does not seem strange or out of place. One may think of a conventional case, of a company making steel and then extending its operations back to the coking coal, limestone and ore in the ground. It cannot go farther back than that,

whereupon it can now move along the same line, but in the opposite direction. Instead of buying its raw materials it came to produce them; and now, instead of selling what is ordinarily considered the "finished product" of the steel mill, it can consume that product by converting it into still more finished forms.

With the great change in the pricing system for steel products it cannot be expected that steel movements will go on just as before. The recourse of mills absorbing freights to retain customers they previously had may seem simple, but it is advisable not to consider it a permanent and sufficient one, when the steel producing industry seems to be quite fully developed, from a tonnage standpoint, for the present consumptive requirements of the country.

Obviously the building of new mills at removed points would not meet such a situation, but would merely aggravate it. What is needed is not more steel mills but more steel consumption. Nor does it follow, of course, that the steel makers ought now to turn in and become competitors of their customers as a whole.

There is room for distinctions, however. Some of the customers of the steel industry are efficient and perform excellent service. Others may not be so efficient. With resources of capital and skill some operations of working up steel may be done better by steel mills than they are now being done. A great deal lies still beyond this. Not all the possible uses of steel have been discovered and developed. There will be more development, new lines of consumption. The steel mills may pick up such lines before others do. Then they would be competing with no customer. They would be creating customers.

The Worker's Prosperity

A WRITER in the London *Daily Mail* contrasts the conditions of industrial workers in Great Britain and in the United States, asserting, as is true, that American workers are far better fed, clothed and housed. Particularizing he says:

The true wealth of a nation can best be measured by the condition of the masses. The prosperity of the American workers is almost unbelievable. More or less unskilled men, such as carters, milkmen, builders' laborers, etc., earn 45s. per day. Vast numbers of skilled workers earn £1,000 and more per year.

The assertion that America's wealth belongs to the few, that the high cost of living counterbalances the high wages prevailing, is incorrect. The white population of the Republic is a little more than twice as large as that of this country. However, the United States have not merely twice the number of telephones and motor cars that there are in this country, but have fifteen times as many. To every three families there are two telephones and two motor cars. Millions of unskilled workers have not only roomy houses which belong to them, but have a telephone, a motor car and other luxuries of which English workingmen scarcely dream.

Yet the attempt has been made again, in the election campaign which is closing as this is written, to arouse and play upon unrest among American workers by holding up their condition as direful. They have been urged to adopt revolutionary policies as remedies for their ills—to

vote for public ownership of transportation and all other public services and to throw away the constitutional guaranty of an independent judiciary. Had this last appeal to envy, discontent and prejudice been successful no better description could be found for the results that would shortly be seen in American industry than this of an old-time epitaph:

*I was well;
I thought to be better;
I took medicine,
And here I lie.*

The Metal of the Air

FORTY years ago aluminum was almost a curiosity. Its cost was high, but its wonderful properties were heralded widely. It was predicted by those whose imaginations are even today prophetic, that some day it would be available commercially in large quantities and at a reasonable price, revolutionizing some phases of modern life. In the home and elsewhere it is now a familiar metal.

Within a few weeks, two epochal events have thrilled the American people. A giant airship has crossed the Atlantic safely, making a journey of over 5000 miles at a speed never equaled in a long air trip. Another has made a 10,000-mile air cruise from New Jersey to California and back. Aluminum in the form of duralumin has made possible these notable feats. The frame work of these great ships, made of an alloy of aluminum with small amounts of manganese, copper and other metals, after suitable heat treatment, is as strong as mild steel and almost as light as wood.

What will another forty years bring? Undoubtedly more airships, including safe and rapid transportation over long distances. Perhaps the use of light, strong alloys in airplanes, which then may be as common as automobiles were 20 years ago. We need not think of alloys of aluminum or of magnesium with other elements, either as duralumin or other combination, as in any but the early stages of their development. It is another romance of mechanical progress that a metal so abundant and so widely distributed over the earth should have the distinction of making possible this marvelous mastery of the air in long flights.

A CONTINUOUSLY poor showing is made by American exporters of steel. In the past three months shipments abroad have been the smallest for the year. From the figures elsewhere in this issue it appears that in the third quarter our exports of all products, including pig iron and scrap, average only 135,900 gross tons per month and that for the first nine months the monthly average has been only 143,500 tons. This is but 86 per cent of the average in 1923 and only about 60 per cent of the 1913 rate. Seeing that our foreign sales of pig iron and scrap to Oct. 1 this year were 50 per cent larger in each case than those of last year, the shrinkage in finished steel is the more accentuated. In the meantime British steel is going out in a steady stream to foreign consumers, while Belgian and French exports are

mounting almost by the month. The American steel industry does not expect to be a large factor in international trade while Europe's capacity lacks so much of full employment as has been the case in the troubled two-year period now ending. There is reason to look for a quickening on all continents in 1925 and with it for an increased demand for American steel in Canada and Japan, which are now taking so large a share of our shipments to outside markets.

Chances for Railroad Development

THE railroad mileage of the world in 1922 is given by the Bureau of Railway Economics, computed from recent issues of *Archiv für Eisenbahnwesen*. The mileage for continents and the respective percentages appear thus:

	Miles	Per Cent
America	371,741	50.2
Europe	228,641	30.9
Asia	77,961	10.5
Australia	29,203	3.9
Africa	33,629	4.5
Total	741,175	100.0

The United States is listed at 251,437 miles, which with 799 miles separately credited to Alaska makes 252,236 miles. This is 34 per cent of the world's mileage, or 68 per cent of the mileage of the two Americas.

About 20 years earlier the same authority had placed the world's railroads at 859,355 kilometers, or 533,658 miles. Thus the increase has been 39 per cent.

In the 20 years there were important changes in the relative positions. The United States proportion of the total decreased from 39 per cent to 34 per cent, but the rest of the Americas increased so that the total for this side of the world decreased only fractionally, from 50.4 per cent to 50.2 per cent. Europe, being old in railroading as was the United States, also decreased in proportion, from 34.9 per cent to 30.9 per cent.

The other continents increased—Asia from 8.7 per cent to 10.5 per cent, Australia from 3.1 per

cent to 3.9 per cent and Africa from 3.9 per cent to 4.5 per cent.

There has been railroad building everywhere, the relative increases being greatest in the backward continents, South America, Africa, Asia and Australia. These continents are still behind North America and Europe. Now that world affairs seem to be in a fair way for a settled period, financing should be possible, and if the people in the countries involved wish to work hard and intelligently they have the opportunity to develop, for the financial resources should be at their command. South America and Central America have made good progress in recent years in building links in the pan-American railroad project that has been a dream of years. The prediction is now made that in three years it will be possible to go by rail from the United States as far south as Buenos Aires.

The history of the United States shows what should naturally occur. Up through the height of our railroad building—that is, the building of miles of road—we were importing rails and some other railroad material from England. Our building of railroads greatly stimulated our iron and steel industry and eventually we not only became self supporting but got into the position of exporting railroad material. The backward countries, building railroads, can and will develop their iron resources if they have any, but through the earlier period they will need to import iron and steel.

Another point in railroad development in the United States is important. Our year of maximum "railroad building," that is, laying of main line track, was as far back as 1887, 37 years ago, while in recent years our mileage has increased but little. Yet our railroad system is now year by year taking more iron and steel than in the year in which the greatest number of miles was built. If we now furnish material for railroad building in other countries we may expect to retain the trade in material for improvement and upkeep of the railroads.

Short-Haul Rates on Iron and Steel Advanced

PITTSBURGH, Nov. 3.—Efforts of producers to secure a suspension of the short-haul rates on iron and steel products from Pittsburgh district mills has not been successful and as of Nov. 1 all rates of 15½c. per 100 lb. or less were advanced 15.8 per cent. Any tariff of more than 15½c. is unaffected by this change. The higher rates all are in effect within the boundary of western Pennsylvania, because the Public Utilities Commission of Pennsylvania does not have the right to suspend a proposed change in freight rates. This is entirely within the discretion of the carriers, and they refused to entertain the protest.

The Ohio State Public Utilities Commission has suspended for 30 days a similar increase in Ohio, which was to have become effective Nov. 1. The new rate on Pittsburgh to Youngstown is 11c. per 100 lb. against 9½c. formerly. The rate to Wheeling also has gone from 9½c. to 11c., and Beaver Falls takes a rate of 8c., instead of 7c. formerly. The rate from Monessen to Pittsburgh has been increased from 6c. to 7c. per 100 lb. The increase in the Youngstown rate imposes a further hardship on Youngstown producers coming into Pittsburgh and also on shipments from Johnstown moving toward Pittsburgh.

Thirteen Stacks Active at Buffalo

BUFFALO, Nov. 3.—Blowing in of the stack of the Tonawanda Iron Corporation, subsidiary of the American Radiator Co., brings the total of the stacks in blast in this district to 13. This stack will make iron for Buffalo and Titusville plants of the radiator company. The furnace has been rebuilt and reequipped, making it a modern stack in every respect.

The Lackawanna plant of the Bethlehem Steel Co. is operating about 60 per cent as is the Donner Steel Co. Wickwire-Spencer is now operating three open-hearth furnaces in place of four. Seneca Iron & Steel Co. has 10 mills in operation, an increase of two.

Manufacturers, distributors and users of steel lockers have been invited to attend a conference on Nov. 19 in the Department of Commerce at Washington, to consider the elimination of excess varieties of steel lockers. This is a sequel to a meeting of manufacturers last February, when it was suggested that the 50 or more sizes and styles could be reduced to a much smaller number and yet serve the intended purposes. A survey shows the bulk of demand to be covered by 14 items. Tentative recommendations include three widths, four heights and four depths. Adoption of these sizes rests on the action of the conference.

Bonus System Applied to Tool Department

Making of Dies Expedited with Resultant Lower Cost

Helping Shop to Secure Orders for Pressed Metal Parts

WITH the continual growth in use of pressed metal for a great variety of parts has naturally come an increase in the number of press shops. This has brought about keen competition on prices. Fluctuations in price will not be so great on the actual press work, in many cases, as they will on the die cost. It has been found in the last few years that a decided mental inflation followed the financial inflation. Most concerns had very liberal ideas as to salaries, which, together with many other causes, produced this condition. When it became evident that the day had passed when costs could be disregarded and a profit still made, mental deflation did not follow so quickly as desirable on efforts at financial deflation. There was a general slackening in productive effort, this condition affecting the entire personnel of establishments from the management down. All were found to be in ruts. Wages being lower than they had been, it appeared to be the idea of labor that it should produce correspondingly less work.

In the production end, this situation was generally relieved by various piece work systems in different shops engaged on repetition work. Improvement in working conditions and generally making employment in any particular shop more pleasant did not arouse the proper cooperation from the men. The only way seemed to be an appeal directly to their pocketbooks. This did not, however, help to lower costs on dies nor inject a spirit of application and cooperation into the tool department men, and in an effort to lower the cost of dies and thereby help in securing orders for pressed metal parts, W. G. Armstrong, formerly general manager of the pressed metal division of the American Tube & Stamping Co., Bridgeport, devised a bonus system for tool room use.

Separate Tool Cost from Operating Cost

In preparing bids for work, it had been made a practice to hold the tool or die cost entirely separate from the cost of actually producing stampings and bids were figured accordingly. While the tools are made by the stamping shop, as a rule, and are maintained by it, the customers pay for them when first made as well as for the stampings. It is found in many cases bidders are told by prospects whose work is solicited that the price for stampings is right but tool costs are high. This has aroused keen competition to reduce those costs. The practice with some shops is to include part of the tool cost in the bid for stampings. Development of the bonus system in the tool room was the result of a belief that the latter practice was not the best.

Accuracy of Estimating Made Bonus Possible

Of course the success of this system depends upon a knowledge that the system of figuring costs is accurate. With this knowledge it is possible to work out a plan of setting a definite tool price for the press tools on each job as orders requiring the making of press tools are received.

The estimating department, for example, will set the time required to finish a certain set of tools as 40 hr. This job will then be given to a tool maker whose day-rate may be set at 70c. per hr. He is told that the price to be paid for that job is \$28. The man working for a bonus will naturally endeavor to complete the job in less than 40 hr., say 35 hr. This would entitle him to \$28 and means after accounting for his pay for 35 hr., or \$24.50, a bonus of \$3.50, payable to him. He will then take up another job at the end of the 35 hr.

In order to prevent any slack, the tools when reported finished by the tool worker must be rigidly inspected and should make a sample stamping, which should also be carefully checked.

If the tools and stamping are correct, the man receives a notice, in the form of a receipt, that on that certain job he earned a bonus of the stated amount, and he receives it in his next pay envelope. If the tools or stamping do not check as correct, the tools are returned to him to be corrected. If he can correct these in 5 hr., he has been able to make his regular day rate. If he cannot correct the tools to produce a perfect sample within the 40 hr. of time set, the bonus arrangement on that job would be cancelled and he would be paid his day rate for actual time consumed. If a man persistently runs behind, that is, if he cannot complete perfect tools in the time set, he is automatically classed as an inefficient worker.

Competitive Effort Instituted

In conjunction with the bonus arrangement and as a further inducement to the men, the monthly bonus earnings of each are computed, and first, second and third prizes amounting to \$15, \$7 and \$3, respectively, are paid the three high men. A board in the tool room, headed with the caption: "Prize Winners for Last Month," carries the names of the three men who won prizes. Each man's name is stamped on a steel plate, which is hung on the board on brads. Naturally each man endeavors to have the plate bearing his name hung in first prize position and works toward that end. With pay on the hourly rate plus bonuses earned and prize money, it is possible for the tool workers to earn a high rate of pay. The first prize money won after installation of such a system might well be paid the winner before the entire tool room force.

After the plan has been in operation for some months, a vote may be taken among the men, as to whether they desire to have it continued. It will probably be found that the vote will be about 95 per cent favorable. Those who vote against it will be found to be the poor men, as the good men are generally all keenly in its favor. Incidentally it will be found necessary for superintendent and foreman to be practical tool workers.

The premium card on its obverse side should show data regarding the work, workman's name and hourly rate, and the price set for the job on which he works. On the reverse side space should be provided for total time by days. The total number of hours is multiplied by the workman's hourly rate and then compared with the job price for that particular tool. The difference in his favor, if any, of course, shows the bonus for that job.

Losses Practically Eliminated

On the theory that tools should show no profit, but should be sold to customers at actual cost, this system will enable the shop to break practically even on tool costs. Tools occasionally cost less, occasionally more than the price bid. As a general thing, however, they will be very close if the figuring is accurate. Most tool rooms are an expense. Many shops have adopted the practice of absorbing part of such tool cost in the profit on production. With the bonus system it is possible practically to eliminate the matter of tool room loss. A detailed report each month should be handed the manager.

OCTOBER IRON OUTPUT

Increase Over September 11,468 Tons Per Day

Net Gain of 9 Furnaces, with 13 Blown in and 4 Shut Down

October has again demonstrated that it is a large production month. The pig iron output registered a very sharp gain over September—11,468 tons per day, or nearly 17 per cent. Much faster rate of operations is the main cause of the expansion.

The production of coke pig iron for the 31 days in October amounted to 2,477,127 gross tons, or 79,907 tons per day, as compared with 2,053,264 tons, or 68,442 tons per day for the 30 days in September. This increase of 423,863 tons, or 11,468 tons per day, is 16.8 per cent, which compares with an increase of nearly 12.5 per cent in September over August. Two years ago, or in October, 1922, the increase was 17,301 tons per day.

There were 13 furnaces blown in and only 4 blown out or banked in October, the net gain being 9 as compared with 23 in September and 6 in August. The capacity of the 182 furnaces active on Nov. 1 is estimated at 81,490 tons per day, contrasting with 72,235 tons per day for the 173 furnaces in blast Oct. 1. Of the 13 furnaces blown in last month 3 were Steel Corporation furnaces, 5 were independent steel company stacks and 5 were merchant units. Two independent and 2 merchant stacks were shut down.

The ferromanganese output in October was only 7780 tons, or the smallest this year. The spiegeleisen production of 10,047 tons was the third largest.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months from October, 1923, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons		
	Steel Works	Merchant
October, 1923.....	77,255	24,331
November	72,352	24,124
December	69,921	24,304
January, 1924	73,368	24,016
February	83,126	22,900
March	86,276	25,533
April	82,101	25,680
May	62,176	22,182
June	50,237	17,304
July	43,353	14,224
August	45,591	15,284
September	50,312	18,130
October	59,952	19,955
		79,907

The figures for daily average production, beginning with January, 1918, are as follows:

1918	1919	1920	1921	1922	1923	1924
77,799	106,525	97,264	77,945	53,063	104,181	97,384
82,835	105,006	102,720	69,187	58,214	106,935	106,026
103,648	99,685	108,900	51,468	65,675	113,673	111,809
109,607	82,607	91,327	39,768	69,070	118,324	107,781
111,175	65,002	96,312	39,394	74,409	124,764	84,358
110,793	70,495	101,451	35,494	78,701	122,548	67,541
110,354	78,340	98,931	27,889	77,595	118,656	57,577
109,341	88,496	101,529	30,780	58,586	111,274	60,875
113,942	82,932	104,310	32,350	67,791	104,184	68,442
112,482	60,115	106,212	40,215	85,092	101,586	79,907
111,802	79,745	97,830	47,183	94,990	96,476	....
110,762	84,944	87,222	53,196	99,577	94,225	....
Year 105,496	83,789	99,492	45,325	73,645	109,713	....

Production of Steel Companies—Gross Tons

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the foregoing totals of steel making iron, month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total Production	1923		1924	
		Fe-Mn	Spiegel	Fe-Mn	Spiegel
Jan.	2,479,727	2,274,005	19,358	12,056	20,735
Feb.	2,259,154	2,410,658	21,282	3,657	22,405
Mar.	2,724,305	2,674,665	20,730	13,832	22,351
Apr.	2,704,360	2,463,027	20,808	7,440	23,580
May	2,976,892	1,927,461	19,568	9,533	14,993
June	2,727,203	1,507,110	19,717	18,289	20,049
1/2 year	15,871,646	13,256,826	121,564	64,807	124,113
July	2,752,733	1,343,952	26,493	12,876	14,367
Aug.	2,680,851	1,413,314	22,045	5,586	10,718
Sept.	2,363,967	1,509,360	23,206	4,478	13,263
Oct.	2,394,922	1,858,502	20,015	15,931	7,780
Nov.	2,170,567	.....	14,839	16,783	....
Dec.	2,167,563	.....	18,069	10,124	....
Year	30,402,254	.....	246,231	130,585	....

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for October and the three months preceding.

Pig Iron Production by Districts, Gross Tons

	Oct. (31 days)	Sept. (30 days)	Aug. (31 days)	July (31 days)
New York	145,930	101,702	80,656	86,738
New Jersey	79,473	63,458	57,745	45,480
Lehigh Valley	51,966	51,927	51,153	50,735
Schuylkill Valley	37,157	27,233	21,696	21,970
Pittsburgh district	519,015	437,864	425,471	380,058
Shenango Valley	86,279	84,018	82,058	66,350
Western Pa.	116,730	82,639	59,479	43,754
Maryland, Virginia and Kentucky	66,896	41,470	34,106	42,072
Wheeling district	94,976	80,465	72,678	61,728
Mahoning Valley	222,344	195,292	167,073	142,348
Central and Northern Ohio	265,020	243,011	222,070	223,295
Southern Ohio	34,722	15,542	12,243	12,509
Illinois and Indiana	390,556	302,112	271,474	267,161
Mich., Minn., Mo., Wis., Colo. and Wis.	102,839	92,764	98,682	109,068
Alabama	250,472	221,190	215,556	218,676
Tennessee	12,752	12,487	14,975	12,957
Total	2,477,127	2,053,264	1,887,145	1,784,899

Capacities in Blast Nov. 1

The following table shows the number of furnaces in blast Nov. 1 in the different districts and their capacity, also the number and daily capacity in gross tons of furnaces in blast Oct. 1:

Coke and Anthracite Furnaces in Blast

Location of Furnaces	Total Stacks	Nov. 1		Oct. 1	
		In Blast	Capacity per Day	In Blast	Capacity per Day
New York:					
Buffalo	22	13	5,100	11	4,300
Other New York	5	0	....	0	....
New Jersey	4	0	....	0	....
Pennsylvania:					
Lehigh Valley	12	5	2,400	5	2,145
Spiegeleisen	2	1	155	1	165
Schuylkill Valley	15	5	1,975	5	1,730
Lower Susquehanna	9	2	925	2	900
Ferromanganese	1	1	45	0	....
Lebanon Valley	4	1	225	1	190
Ferromanganese	2	1	45	1	45
Pittsburgh District	55	34	16,575	31	14,960
Ferro and spiegel	4	3	310	3	300
Shenango Valley	17	6	2,785	6	2,800
Western Pa.	22	9	3,765	9	3,150
Ferro and spiegel	2	0	....	0	....
Maryland	5	4	1,955	4	1,690
Ferromanganese	1	0	....	0	....
Wheeling District	14	7	3,265	6	2,680
Oho:					
Mahoning Valley	28	14	7,285	14	6,960
Central and Northern	25	15	8,550	15	7,600
Southern	14	3	1,120	3	670
Illinois and Ind.	42	21	12,725	20	10,670
Mich., Wis. and Minn.	12	6	2,570	5	2,090
Colo., Mo. and Utah	6	3	1,050	3	1,000
The South:					
Virginia	17	1	125	2	265
Ferromanganese	1	1	50	0	....
Kentucky	7	0	....	0	....
Alabama	39	23	8,080	23	7,510
Ferromanganese	1	0	....	0	....
Tenn., Ga. and Texas	15	3	410	3	415
Total	403	182	81,490	173	72,235

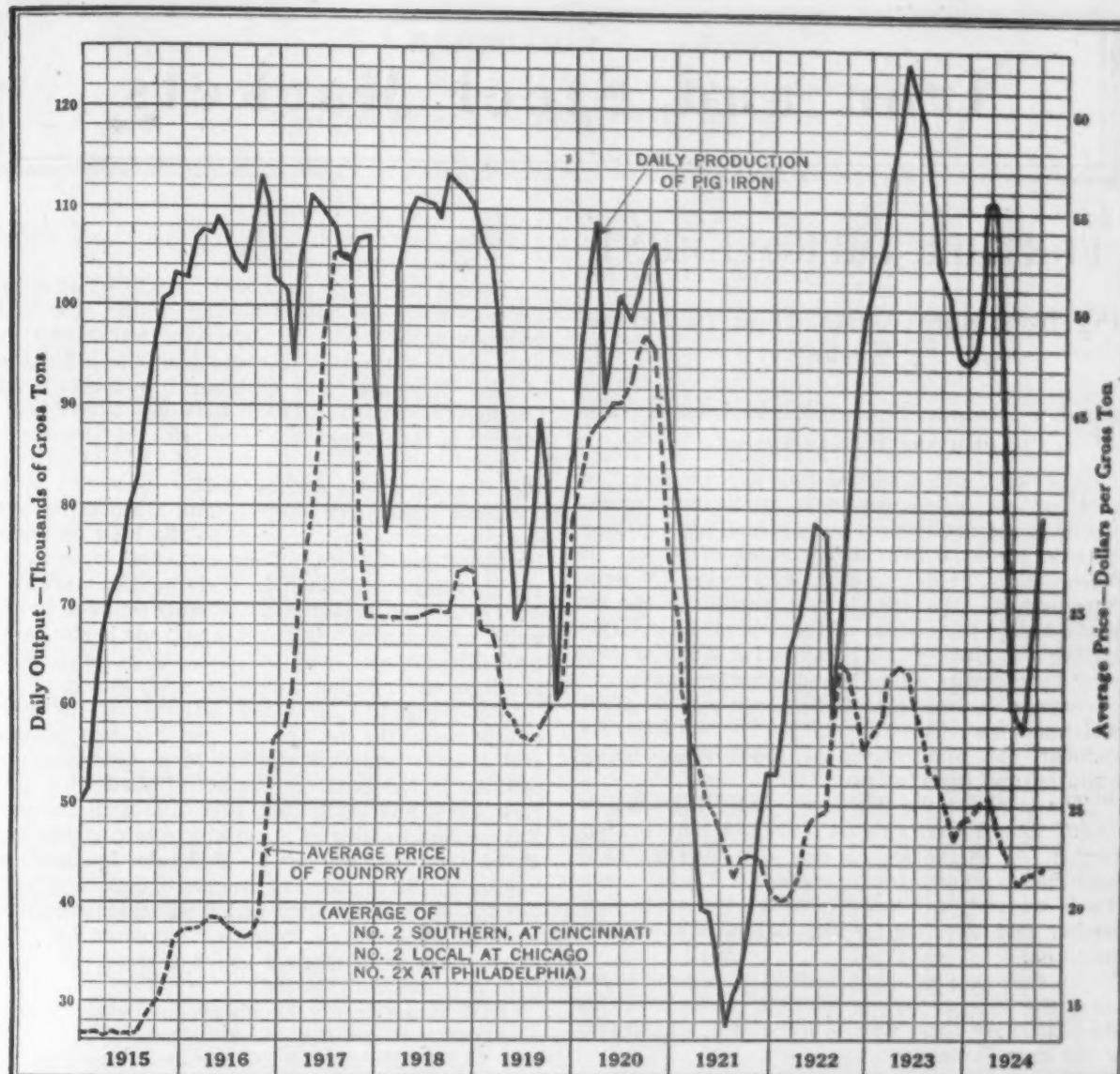


Diagram of Pig Iron Production and Price

Among the furnaces blown in during October were the following: One Niagara furnace of the American Radiator Co., one Susquehanna furnace of the Rogers-Brown Iron Co. and the Buffalo C furnace in the Buffalo district; the Vesta furnace in the Lower Susquehanna Valley; one Duquesne and one Lucy furnace of the Carnegie Steel Co. and the Clinton furnace in the Pittsburgh district; B furnace of the Cambria plant of the Bethlehem Steel Corporation in western Pennsylvania; the Martins Ferry furnace of the Wheeling Steel Corporation in the Wheeling district; Mattie furnace in the Mahoning Valley; No. 1 South Chicago furnace of the Illinois Steel Co. in the Chicago district; one furnace of the Colorado Fuel & Iron Co. in Colorado and the Zenith furnace in Minnesota.

Among the furnaces blown out or banked during October were the following: Buffalo A furnace in the Buffalo district; the Adrian furnace in western Pennsylvania; the Jeannette furnace of the Youngstown Sheet & Tube Co. in the Mahoning Valley and one furnace of the Colorado Fuel & Iron Co.

Production and Price Chart

The fluctuations in pig iron production from 1915 to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of the daily average production, by months, of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at

furnaces in Chicago, and No. 2X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in United States by Months, Beginning Jan. 1, 1920—Gross Tons

	1920	1921	1922	1923	1924
Jan. . .	3,015,181	2,416,292	1,644,951	3,229,604	3,018,890
Feb. . .	2,978,879	1,927,257	1,629,991	2,994,187	2,074,757
Mar. . .	3,375,907	1,595,522	2,025,920	3,523,868	3,466,086
Apr. . .	2,739,797	1,193,041	2,072,114	3,549,736	3,233,428
May . . .	2,985,682	1,221,221	2,306,679	3,867,094	2,618,110
June . . .	3,043,540	1,064,388	2,361,028	3,670,445	2,026,221
<hr/>					
1/2 year 18,128,986	9,428,166	12,050,682	20,841,584	17,424,492	
July . . .	3,067,043	864,555	2,405,365	3,878,834	1,784,899
Aug. . .	3,147,402	954,193	1,816,170	3,469,498	1,887,145
Sept. . .	3,129,323	985,529	2,038,720	3,125,512	2,053,264
Oct. . .	3,292,597	1,246,676	2,637,844	3,149,158	2,477,127
Nov. . .	2,924,908	1,415,481	2,849,708	2,994,295	.....
Dec. . .	2,702,855	1,649,086	3,086,398	2,920,982	.....
<hr/>					
Year* . . .	36,414,114	16,543,686	26,880,383	40,059,308	.....

*These totals do not include charcoal pig iron. The 1923 production on this iron was 251,177 tons.

Production of bituminous coal in the United States is reported by the Geological Survey at 10,298,000 net tons for the week ended Oct. 25, compared with 10,261,000 tons for the Oct. 18 week of 10,553,000 tons for the Oct. 11 week. All these figures are lower than the corresponding production of the previous year. The total production of the calendar year up to Oct. 25 is given as 373,459,000 tons, compared with 454,278,000 tons for the corresponding period last year.

Iron and Steel Markets

FURTHER IMPROVEMENT

Pig Iron More Active Than in Several Weeks

October Output Shows Marked Gain—Bar Buying Has Increased

The week preceding election day brought further evidence of improvement, particularly in the pig iron market, where buying and inquiry were on a larger scale than in a number of weeks. In finished steel, producing companies looked for more improvement after the election, though in the important steel bar market of the Central West larger buying was already under way and at Chicago there were more orders for rails and other track steel.

Strong confirmation of the recent reports of increasing output is given by the pig iron statistics for October, the performance of the furnaces going quite beyond expectations.

The total for the month was 2,477,127 tons, or 79,907 tons a day, against 2,053,264 tons in September, or 68,442 tons a day—the average daily gain being 11,465 tons, or nearly 17 per cent. There was one day more in October than in September, and crowding for high output is an October tradition.

No such gain had been made in a previous month since the October output of 1922, when following the coal strike there was an increase of 17,300 tons a day over September.

Thirteen furnaces blew in in October and four blew out, making the net gain nine. The 182 furnaces active on Nov. 1 had a daily capacity of 81,490 tons, against 72,235 tons a day for 173 furnaces on Oct. 1.

Steel works furnaces made most of the gain in October output—9640 tons a day, against 1825 tons for merchant furnaces. Thus the steel ingot statistics of next week will also show a large increase over September.

While there is no prediction of such a release of finished steel orders after the election as will advance prices, there is more disposition to quote 2c. at Pittsburgh on bars and structural shapes, or \$2 a ton above the market of mid-October.

The Missouri Pacific has divided among four mills orders for 30,000 tons of 1925 rails, and the Chesapeake & Ohio probably will buy a like amount this week. A Chicago mill meanwhile has put 12,000 tons of tie plates on its books. New car orders are few, but 4000 underframes have been placed.

Tin plate mills of the Steel Corporation and of independent companies have shared in orders for 500,000 boxes, or 25,000 tons, of export tin plate just placed by oil companies, including Standard Oil Co. subsidiaries—the largest buying of oil plates in a good many months.

The tin plate price for first quarter and first half of 1925 is not named as yet, but the continuance of \$5.50 per box is looked for. The fact that Welsh tin plate makers are well booked has helped the export trade of mills here, and on recent

Japanese business British and American prices have shown little deviation.

Recent orders for steel bars have filled up some Chicago mills for the remainder of the year and bar buying by bolt, nut and rivet works and by automobile spring and forging plants is a feature of the Cleveland and Pittsburgh markets. At Chicago the closing of 15,000 tons of concrete reinforcing bars is expected by Nov. 15. At Cleveland, competition has brought a price of 1.80c. at mill on rail steel bars, or a decline of \$2 a ton.

Some Pittsburgh district and Ohio mills are less disposed to hold business to the west of them by absorbing freight. Thus rather sharper competition has come about in their nearer territory.

There is no considerable backlog tonnage in tin plate, wire or pipe. Oil well pipe trade is slow and probably 50 per cent of capacity is employed. Rollings on line pipe orders are well along.

Following the increased activity of the preceding week, the demand for pig iron has become still greater and inquiries for large tonnages are pending in the East, particularly Philadelphia and New York, and in Buffalo, Cleveland and Chicago. Buying and inquiry of a radiator company are put at 25,000 to 50,000 tons. Moderate increase in buying at Pittsburgh has brought a decline of 50c. per ton on both foundry and steel making grades, while at Philadelphia, following increased activity, prices have been marked up, but these advances have not been fully tested.

Lake Superior ore shipments in October were 5,596,648 tons and the season movement to Nov. 1 was 40,558,325 tons, or 25 per cent less than in 1923 to that date. Water shipments for the year are put at 42½ to 43 million tons, as compared with 59 millions in 1923.

Pig iron, according to THE IRON AGE composite price, is \$19.21 per ton, compared with \$19.46 last week, the decline being in basic iron. The current figure is the lowest for 1924, comparing with \$22.02 a year ago.

Finished steel remains at 2.46c. per lb., THE IRON AGE composite having held at that figure for three weeks. One year ago it was 2.775c. per lb.

Pittsburgh

Buying Still Very Conservative—Pig Iron Prices Decline

PITTSBURGH, Nov. 3.—Although there is even more confidence than a week ago that the result of the Presidential election will be favorable from a business standpoint, evidence that this is being discounted in the steel market still is lacking. Local mills still are getting a very fair run of mail orders and specifications against the actual requirements of buyers, but there is no sign of much forward buying as yet and the idea is that buyers will hardly be influenced by the election results to rush into the market. A common belief is that a favorable verdict at the polls will be reflected in early 1925 business rather than in the needs for the remainder of the year.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Nov. 4, 1924	Oct. 28, 1924	Oct. 7, 1924	Nov. 6, 1923	Sheets, Nails and Wire, Per Lb. to Large Buyers:	Nov. 4, 1924	Oct. 28, 1924	Oct. 7, 1924	Nov. 6, 1923
No. 2X, Philadelphia†	\$21.76	\$21.76	\$21.76	\$22.64	Sheets, black, No. 28, P'gh.	3.50	3.50	3.50	3.75
No. 2, Valley Furnace†	19.00	19.50	19.50	22.50	Sheets, black, No. 28, Chicago dist. mill.	3.60	3.60	3.60	...
No. 2, Southern, Cin'ti†	21.55	21.55	21.55	23.55	Sheets, galv., No. 28, P'gh.	4.60	4.60	4.60	5.00
No. 2, Birmingham, Ala.†	17.50	17.50	17.50	19.50	Sheets, galv., No. 28, Chicago dist. mill.	4.70	4.70	4.70	...
No. 2 foundry, Chicago*	20.50	20.50	20.50	24.50	Sheets, blue, 9 & 10, P'gh.	2.70	2.70	2.70	3.00
Basic, del'd, eastern Pa.	20.00	20.00	20.00	23.00	Sheets, blue, 9 & 10, Chicago dist. mill.	2.80	2.80	2.80	...
Basic, Valley furnace.	18.50	19.00	19.00	22.00	Wire nails, Pittsburgh	2.75	2.75	2.75	3.00
Valley Bessemer, del. P'gh.	21.26	21.76	21.76	26.26	Wire nails, Chicago dist. mill	2.85	2.85	2.85	...
Malleable, Chicago*	20.50	20.50	20.50	24.00	Plain wire, Pittsburgh	2.50	2.50	2.50	2.75
Malleable, Valley	19.50	19.50	19.50	22.00	Plain wire, Chicago dist. mill	2.60	2.60	2.60	...
Gray forge, Pittsburgh	20.26	20.76	20.76	23.76	Barbed wire, galv., P'gh.	3.45	3.45	3.45	3.80
L. S. charcoal, Chicago	29.04	29.04	29.04	29.15	Barbed wire, galv., Chicago dist. mill	3.55	3.55	3.55	...
Ferromanganese, furnace	95.00	95.00	95.00	110.00	Tin plate, 100 lb. box, P'gh.	\$5.50	\$5.50	\$5.50	\$5.50
Rails, Billets, Etc., Per Gross Ton:									
O.-h. rails, heavy, at mill.	\$43.00	\$43.00	\$43.00	\$43.00					
Bess. billets, Pittsburgh	35.50	35.50	36.00	40.00					
O.-h. billets, Pittsburgh	35.50	35.50	36.00	40.00					
O.-h. sheet bars, P'gh.	37.00	37.00	37.00	42.50					
Forging billets, base, P'gh.	40.50	40.50	42.00	45.00					
O.-h. billets, Phila.	41.17	41.17	41.17	45.17					
Wire rods, Pittsburgh	45.00	45.00	46.00	51.00					
Skelp, gr. steel, P'gh. lb.	1.90	1.90	2.00	2.40					
Light rails at mill	1.80	1.80	1.85	2.15					
Finished Iron and Steel,	Cents	Cents	Cents	Cents					
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents					
Iron bars, Philadelphia	2.32	2.32	2.32	2.67					
Iron bars, Chicago	2.10	2.10	2.10	2.40					
Steel bars, Pittsburgh	2.00	2.00	2.00	2.40					
Steel bars, Chicago	2.00	2.00	2.00	2.50					
Steel bars, New York	2.34	2.34	2.34	2.74					
Tank plates, Pittsburgh	1.80	1.80	1.80	2.50					
Tank plates, Chicago	2.10	2.00	2.00	2.60					
Tank plates, New York	1.94	1.94	1.94	2.74					
Beams, Pittsburgh	1.90	1.90	2.00	2.50					
Beams, Chicago	2.10	2.00	2.00	2.60					
Beams, New York	2.14	2.14	2.24	2.74					
Steel hoops, Pittsburgh	2.50	2.50	2.50	3.15					
*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.									
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.									

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

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On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market report on other pages.

THE IRON AGE Composite Prices

Nov. 3, 1924, Finished Steel, 2.460c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

Oct. 28, 1924.	2.460c.
Oct. 7, 1924.	2.474c.
Nov. 6, 1923.	2.775c.
10-year pre-war average.	1.689c.

Nov. 3, 1924, Pig Iron, \$19.21 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

Oct. 28, 1924.	\$19.46
Oct. 7, 1924.	19.46
Nov. 6, 1923.	22.02
10-year pre-war average.	15.72

1924 to Date	High	Low	1923	High	Low
2.789c., Jan. 15.....	2.460c., Oct. 14.....	2.824c., April 24.....	2.446c., Jan. 1	2.808c., March 20.....	2.077c., Nov. 20
\$22.88, Feb. 26.....	\$19.29, July 8.....	\$30.86, March 20.....	\$20.77, Nov. 20		

While the pig iron market has shown more activity, this cannot be construed as denoting anxiety on the part of meltters, since sales of the leading grades have been at a decline of 50c. a ton from recent levels. The situation here is that the supply of iron exceeds the demand and the advantage is largely with the consumers. Steel prices have undergone no particular change since a week ago. Indeed, prices have held well for the last three weeks, or since the trade began to find its feet following the abolition of Pittsburgh as the sole basing point. The Carnegie Steel Co. is quoting bars and shapes firmly at 2c., base Pittsburgh, and other local producers are adhering to the same figure on these products. There were sales a short time ago

of both lines as low as 1.90c., Pittsburgh, but it is doubtful whether supplies now can be had at that price. While the first inclination of producers of the lighter forms of steel was to hold distant customers through the equalization of freights with more favorably located mills, there has lately developed a tendency to abandon customers whose business entailed a loss through heavy freight absorption. This has helped outside producers, but it has also meant concentration of sales efforts in the territory adjacent to Pittsburgh and in some instances this has produced price cutting.

There has been a slight recession in steel works operations in the Youngstown district, but the recent rate of production is well maintained in Pittsburgh and

Wheeling, and at Johnstown, Pa., ingot capacity is close to 60 per cent engaged. Taking Pittsburgh and nearby districts collectively, the average rate of steel production is about 60 per cent. Mills have fairly good order books in cars and in structural shapes, but have little in sight in plates. Western district mills of the American Sheet & Tin Plate Co. appear better off on orders than do the mills of that company in this district. There is not much backlog business in tin plate, wire or pipe. Some interest is apparent in first quarter tonnages of furnace coke, but no actual business of this sort has been done.

There is a very firm market in the open-hearth grades of scrap iron and steel and with dealers paying as much and in some cases more than the mills, it is evident that they have strong faith in the future. Supplies of scrap outside of dealers' yards are very light and it is not disputed that if the mills start buying prices will move upward.

Pig Iron.—Consumers in this district are not discounting the election by their purchases. There is more activity than has been observed before in several weeks, but seeing that prices of basic, foundry and Bessemer grades have dropped 50c. a ton, it is evident that there has been more anxiety on the part of producers to sell than on the part of melters to buy. The Pittsburgh district sheet maker who recently inquired for 5000 tons of basic iron was able to obtain this tonnage at a price equal to \$18.50, Valley furnace. Failure of Valley producers to get the order appears to have prompted them to revise their prices to a point where business could be done. We note a sale of 1500 tons of basic at \$18.50, Valley furnace, and a Valley steel producer is credited with having bought 2000 tons at the same price. We also note a sale of 2000 tons of Bessemer iron at \$19.50, Valley furnace, this iron for shipment starting immediately. W. P. Snyder & Co. report the average price of Bessemer iron from Valley furnaces in October at \$20, the same price as the month before, but find the average on basic iron to have been \$18.50, as compared with \$19 in September. The sales of the past week explain the basic average price which did not have the benefit of sales at the higher quotation recently carried. While there are sales of foundry iron at \$19.50 for No. 2, there is also business at \$19 of sufficient volume to make the price part of the quotation range. As a matter of fact, only a very small percentage of the iron shipped in this quarter has carried a higher price than \$19.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$18.50
Bessemer	\$19.50 to 20.00
Gray forge	18.50 to 19.00
No. 2 foundry	19.00 to 19.50
No. 3 foundry	18.50 to 19.00
Malleable	19.50
Low phosphorus, copper free	28.00 to 29.00

Ferroalloys.—The situation here lacks new features. Both domestic and British producers are on a base of \$100, seaboard or furnace, for ferromanganese, but beyond a few carloads of domestic material, there have been no sales at that price, and sales of importance at that level seem remote in view of the fact that consumers are so well covered on material carrying much lower prices. Spiegeleisen still ranges from \$30 to \$33, furnace, for 20 per cent domestic material, according to the amount involved, the lower price being available on lots of 500 tons or more. Offerings of 50 per cent ferrosilicon for early shipment at \$70, delivered, or slightly less, appear to have vanished, but it is by no means certain that a bid of that price would be turned down by the maker who offered to sell that low. There is not much demand for this material. Prices are given on page 1039.

Semi-Finished Steel.—Producers seem disposed to take a firmer stand on prices, this on the basis of costs and the fact that cut prices on crude steel make difficult the stabilization of finished steel prices, now regarded as necessary in view of recent unfavorable earnings statements by almost all steel companies. Demand has not increased sufficiently to lend firmness to the

market. On such business as is passing \$35.50 is the prevailing price here and in Youngstown on large billets and slabs and \$37 at the same points is the commonly accepted market on sheet bars. It is not easy to uncover a price of less than \$46, base, on wire rods here, although local mills shipping west are not able to net more than \$45, counting the freight equalization with competing mills. Going east, not much trouble is had in getting the full price. There is little open market activity in steel skelp. Prices are given on page 1039.

Wire Products.—Business, in both volume and characteristics, is typical of the time of the year. While the election has possibly exerted some influence upon the demand, the lack of real activity is fundamental and finds its best explanation in the fact that the mills are well able to make early deliveries, buying for some time having been of a hand-to-mouth variety. This has made impossible the accumulation of mill backlog, while there is the usual caution among jobbers and manufacturers about taking on supplies so close to inventory time. Mills are cultivating their "natural" territories more intensively than they did prior to the abolition of Pittsburgh as a sole basing point. This makes for relative price steadiness in the various districts. Those mills still taking care of customers in other districts are finding freight absorption rather costly, which no doubt explains a tendency to concentrate on adjacent territory until distant destinations are made more profitable through the more favorably situated producers becoming filled up. Coated nails are weak and no sales are possible outside the Pittsburgh area at as high as \$2.10, base, per count keg. Prices are given on page 1038.

Rails and Track Equipment.—Rail mills of the country have a reasonably good operating outlook in view of the orders distributed over the past few weeks for standard sections for 1925 delivery. These rails will not be wanted in volume much before next March, but rolling will begin around the middle of next month. There have been no suggestions of any other price than \$48, mill, for standard rails. Light rails are selling only fairly and usually only small lots are involved. Billet rails still are priced at from 1.80c. to 1.90c., base, mill, but it is a very small lot that cannot be placed at the lower figure. Railroads have not yet followed up their rail purchases with inquiries for the spikes and other accessories. Prices are given on page 1038.

Tubular Goods.—Except for the fact that boiler tube prices are slightly stronger through a general tendency to clip the supplementary discounts, the tubular goods situation is without material change. None of the makers of lap welded steel tubes now is giving more than 5 fives beyond the card, as against 6 fives recently, while the supplementary discounts on charcoal iron tubes has been cut from 3 to 2 tens. Fairly good demand continues for merchant pipe and capacity for making this class of goods is rather well engaged. Oil well pipe, however, is slow and it is doubtful whether lap weld capacity is as much as 50 per cent employed, especially as line pipe orders have been pretty well completed and new ones are few and small. Decline in oil production is favorable to the outlook, but the supply situation still is rather unfavorable. Discounts are given on page 1038.

Cold-Finished Steel Bars and Shafting.—Bars are selling fairly well, but mostly in small lots for early delivery, demand generally lacking volume and inclination of consumers or jobbers to stock up. Special shapes and shafting are not moving with much snap. Not much is heard now about the setting up of the several basing points on cold bars and shafting, because the change does not mean as much equalization of freights as was at first feared. The price in this district remains at 2.70c., base, with freight equalized with other producing districts when necessary. Ground shafting holds at 3.10c., base, f.o.b. mill.

Hot-Rolled Flats.—The market is well maintained on hoop and band sizes, but on the wider material the situation is still unsettled by the competition from the product of small plate and jobbing mills. Strips are

quotable from 2.25c. to 2.40c., when sold on a base price, but net prices still are being made and deducting the extras means a lower price than 2.25c. Demand is steady for small lots for early delivery, but there is not much forward buying except in rim stock and for strips for cold rolling, there being a fairly good market for cold-rolled strips. Prices are given on page 1038.

Cold-Rolled Strips.—Very fair demand is reported and local makers do not find it necessary to go below 4c., base, mill, to secure orders, even in the districts that may be considered competitive owing to the fact that they have producing capacity. Mills here find they have to absorb little freight except right into destinations where there are producers.

Bolts, Nuts and Rivets.—The market is firm and fairly active on bolts and nuts, but that is hardly the story about rivets, on which some of the smaller producers still are cutting prices to secure business. The regular price of \$2.60, base, per 100 lb. for large rivets is being shaded as much as \$2 per ton by the smaller makers. Specifications against fourth quarter contracts are reported to be increasing and there is not much disposition to question the price. A local car builder recently placed 250,000 bolts with a local maker and its total takings over the past few weeks aggregate close to 1,000,000 bolts. Prices and discounts are given on page 1039.

Iron and Steel Bars.—There is a general tendency on the part of makers of steel bars to resist efforts by buyers to secure tonnages at less than 2c., and some makers have such a backing that they are no longer accepting business for delivery in less than two to three weeks. Eastern mills are not offering much price competition and it is reported from Chicago that the leading independent is not anxious for business at 2c. base, Chicago. A fair demand is noted for iron bars at former prices. Prices are given on page 1238.

Structural Material.—The Carnegie Steel Co. and the Jones & Laughlin Steel Corporation are quoting large structural shapes at 2c. base, Pittsburgh, and are not disposed to consider business at less. Structural lettings are fairly good, although not very well distributed among the various shops in the district. It is reported that several good sized projects are pending and are likely to be placed following election. Plain material prices are given on page 1238.

Plates.—If there is a market, it is a very limited one. Capacity is so far ahead of consumption that prices show no real strength, except to the extent that outside mills cannot ship into the Pittsburgh area and do so profitably. Prices are given on page 1238.

Sheets.—Pause in the demand continues. There has been a considerable let down in the orders of Youngstown district mills, as is indicated in the fact that sheet mill operations there have dropped from about 70 per cent to only slightly more than 50 per cent. The leading interest is having operation of around 70 per cent of capacity, but the best showing is at its Western mills, particularly those engaged on light plates and blue annealed sheets in connection with Western car orders. The price situation shows no particular change. Prices are given on page 1238.

Tin Plate.—No announcement yet has been made as to the prices for first quarter and first half of 1925, but the general belief is that the present price of \$5.50 per base box, Pittsburgh, for standard cokes on domestic business will be continued. The American Sheet & Tin Plate Co. is noncommittal as to suggestions that it might possibly revise its Elwood, Ind., Gary and Chicago prices to the levels now quoted by independent producers. All tin plate for shipment over the remainder of this year has been ordered, and early 1925 business is waiting on an announcement as to prices. The fact that the Welsh tin plate makers are well filled up with business is helping export sales of American mills. Export prices are much higher than they were a short time ago, sales being noted at \$5.10 to \$5.20, the latter for shipments to Canada, as compared with \$4.85 a few months ago.

Coal and Coke.—The coke market does not show

very much life. Most of the demand is for furnace coke or for nonmetallurgical rather than for blast furnace use, as most of the blast furnaces now in production are covered by contracts. Those depending on spot tonnages are finding supplies easily enough at \$3, while for other than blast furnace use there are sales as high as \$3.15. A few inquiries for first quarter tonnages have lately come out, but no large tonnages are involved and no sales are noted. Coke producers feel that by waiting a while they may possibly get better prices than now are obtainable. Foundries in this district are not very well engaged and this is reflected in the demand for foundry coke. The price range still is \$4 to \$4.50, but most of the sales are at the lower figure. The coal market still is weak. Mine run steam coal still is priced at \$1.50 to \$2.10, coking grade from \$1.50 to \$1.85 and gas from \$2 to \$2.25. Steam slack ranges from \$1 to \$1.10 and gas slack from \$1.15 to \$1.30.

Old Material.—The market still displays a very strong tone on the open-hearth grades, not only because of widespread interest on the part of consumers, but also because dealers have much faith in the future of the market and are not pressing sales. They are, moreover, taking up such offerings as are coming on the market and paying \$19 and even \$19.25 for heavy melting grade. It would be impossible to find a round tonnage of this grade here today at less than \$19, and fresh sales for Steubenville delivery are reported at \$20. The market also is looking up on compressed and bundled sheet sides and ends and some fair-sized purchases of machine shop turnings have been made at \$15 to \$15.50, delivered at Brackenridge. Dealers are not finding it easy to cover these sales with outside points paying relatively higher prices. Strangely enough, short turnings and cast iron borings are hard to move and are not bringing as much as the long turnings. Iron foundries are not buying cast scrap, because pig iron is so cheap and the steel foundries are not doing much buying. Pennsylvania Railroad will take bids until noon, Nov. 6, on 40,727 net tons of scrap. The Pittsburgh & Lake Erie Railroad is offering about 2000 net tons in its November list.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton		
Heavy melting steel	\$19.00 to	\$20.00
No. 1 cast, cupola size	19.00 to	18.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	19.00 to	19.50
Compressed sheet steel	17.00 to	17.50
Bundled sheets, sides and ends	16.00 to	16.50
Railroad knuckles and couplers	20.00 to	20.50
Railroad coil and leaf spring	20.00 to	20.50
Low phosphorus blooms and billet ends	22.00 to	22.50
Low phosphorus plate and other material	22.00 to	22.50
Railroad malleable	16.50 to	17.00
Steel car axles	21.00 to	21.50
Cast iron wheels	18.50 to	19.00
Rolled steel wheels	20.00 to	20.50
Machine shop turnings	15.00 to	15.50
Sheet bar crops	20.00 to	20.50
Heavy steel axle turnings	16.00 to	16.50
Short shoveling turnings	14.50 to	15.00
Heavy breakable cast	16.00 to	16.50
Stove plate	15.00 to	15.50
Cast iron borings	14.50 to	15.00
No. 1 railroad wrought	15.50 to	16.00
No. 2 railroad wrought	19.00 to	20.00

Net operating income of the Gulf States Steel Co. for the three months ended Sept. 30, amounted to \$294,908. Deducting taxes, depreciation, etc., there was a net profit of \$176,487, equivalent to \$1.26 a share on the outstanding 112,130 common shares, after making allowances for preferred dividends. Net profits for the quarter ended June 30, this year, after preferred dividends, were \$187,041, or \$1.35 on the common stock capitalization, while for the third quarter of 1923 they were \$336,747 or \$2.68 on the 112,212 common shares outstanding. Earnings on the common shares for the first nine months this year were just about half those for the corresponding period last year. Net earnings aggregated \$719,276 or \$5.47 a share on common stock, against \$1,310,654, or \$10.72 a share in 1924.

Chicago

Heavy Forms of Finished Material Gain—Pig Iron Buying Active

CHICAGO, Nov. 3.—On the eve of election, most departments of the iron and steel market exhibit evidences of reviving confidence. Pig iron buying has been liberal and pending business is large indicating that the sales total for the week will involve an exceptional tonnage.

Mills rolling the heavier forms of finished steel have shown a substantial gain in bookings for the fourth consecutive month. New business booked in October exceeds the tonnage commitments of any other month in 1924 or 1923. Active capacity in soft steel bars is now sold until the first of the year and forward bookings in plates and shapes, while not so heavy, are large. Rail buying for 1925 moved another step forward with the placing of 30,000 tons by the Missouri Pacific, of which 20,000 tons went to Chicago producers. Local mills also received orders for a total of 12,000 tons of angle bars during the week.

Notwithstanding these favorable indications it is still believed that considerable delayed buying will be released after election. It is apparent, however, that political uncertainty has been less of a market factor than had been believed. It is true that in contrast with the heavier products, sheets and wire products are still sluggish, but this is attributed to confusion resulting from the abandonment of Pittsburgh basing rather than to apprehension regarding the outcome of the election. The strength in the heavy tonnage products is manifested in an advance of \$2 a ton in plates and shapes, bringing them up to 2.10c., Chicago. An early advance in pig iron is also looked for.

Mill operations continue to improve. While there is no change in the number of active steel works blast furnaces, one important interest has increased its rate of steel output from 65 to 67 per cent of capacity, and another leading mill is on an 80 per cent basis.

Ferroalloys.—There have been no developments of interest in the ferroalloys.

We quote 80 per cent ferromanganese, \$107.56, delivered; 50 per cent ferrosilicon, \$75, delivered; spiegeleisen, 18 to 22 per cent, \$39.56, delivered.

Pig Iron.—Buying continues to gather momentum and inquiry is the heaviest in months. The American Radiator Co., which generally leads the van in a buying movement, has placed 10,000 tons of foundry for its Western plants, 2700 tons for its Springfield, Ohio, plant and 5000 to 6000 tons for its Birmingham branch, all for first quarter shipment. It is understood that a substantial portion of the tonnage for the Bremen, Litchfield and Kansas City plants was placed with Chicago producers. Among other important sales may be mentioned 1800 tons of foundry for first quarter placed by a Michigan user and 1000 tons of low phosphorus ordered by a Wisconsin melter. Inquiries from users in this immediate district include 3000 tons of foundry and 2600 tons of foundry for first quarter. A Wisconsin melter is in the market for 500 tons of malleable. Local iron is unchanged at \$20.50, base furnace, for shipment during the current quarter, and \$21, base furnace, for first quarter, but there continues to be talk of a possible early advance. Blast furnace stocks have been so sharply reduced that a Federal furnace will probably be blown in within the next few weeks. A sale of 500 tons of Southern foundry in this district at \$17.50, base Birmingham, indicates that prices on Southern iron are unchanged. Less than \$32.50 delivered was done on a recent sale of copper free low phosphorus and pending inquiries for that material aggregate 700 tons. An automobile company

has closed for 600 tons of 10 per cent silvery. Electric ferrosilicon, 14 to 16 per cent, is weaker.

Quotations on Northern foundry, high phosphorus, malleable and basic iron are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25	\$20.50
Northern No. 1 foundry, sil. 2.25 to 2.75	21.00
Malleable, not over 2.25 sil.....	20.50
Basic	20.50
High phosphorus	20.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago..	29.04
Southern No. 2 (barge and rail)	22.18
Southern No. 2, sil. 1.75 to 2.25	\$23.51 to 24.01
Low phos., sil. 1 to 2 per cent, copper free	32.50
Silvery, sil. 8 per cent.....	34.29 to 35.29
Electric ferrosilicon, 14 to 16 per cent	42.92

Plates.—Local mills are now comfortably booked ahead, one important interest being engaged until the first of the year. At the same time, its attitude on prices has stiffened and 2.10c., Chicago, is now the minimum going quotation. There is still considerable car steel to be bought and new oil storage tanks in Oklahoma and Texas involve a total of 2500 tons.

The mill quotation is 2.10c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Structural Material.—Mill prices on plain material have advanced \$2 a ton to 2.10c., Chicago. The desire to take advantage of lower outstanding quotations has brought most pending structural projects to a head, with the result that from 40,000 to 60,000 tons of work is expected to be placed before the end of the current week. Meanwhile, a number of promising new jobs have come up for figures, including new shop buildings for the Illinois Central at Chicago, 7000 tons; a power plant near St. Louis for the Union Electric Co., 2500 tons, and a plant addition at Wheeling, Ind., for the Standard Oil Co., 1500 tons.

The mill quotation on plain material is 2.10c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Bars.—The tonnage of soft steel bars placed by those who discounted a favorable outcome of the election has exceeded expectations. Leading local mills are now booked until the end of the year and have taken some business for first quarter shipment. Prices are firm but unchanged. While it is still felt that some delayed buying will be released following the election, few observers look for such a bulge in business that sharp price advances need to be feared. A moderate advance, however, would not prove surprising. Demand for bar iron and rail steel has held its own, although not comparable with that for soft steel.

Mill prices are: Mild steel bars, 2c. to 2.10c.; common bar iron, 2.10c. to 2.15c., Chicago; rail steel, 2c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting are 3.80c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.10c. to 2.25c.

Sheets.—Demand lags, but in view of the manner in which buyers of bars, plates and shapes have ignored the election, mills are disposed to look elsewhere for a reason. The most plausible explanation appears to be the confusion resulting from the abandonment of Pittsburgh basing. Prices are unchanged.

Chicago delivered prices from mill are 3.65c. for No. 28 black, 2.85c. for No. 10 blue annealed, 4.75c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.80c. base for blue annealed, 4.50c. base for black, and 5.50c. base for galvanized.

Wire Products.—New business has failed to develop in volume and prices lack stability. Wire rods, which are generally quoted at \$48, f.o.b. Chicago district mill, or \$49, delivered Chicago, are unsteady. A sale of 500 tons to a local buyer is said to have brought out a price of \$47. Cement coated nails are also weak. For St. Louis and the southern half of Illinois, prices on wire products are based on delivery from Anderson, Ind. The prices at Anderson are \$1 a ton lower than at Chicago district mills; yet the freight rate from Anderson to St. Louis is identical with the rate from Joliet. For mill prices see page 1038.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed, \$3.05 per 100 lb.; common wire nails, \$3.15 per 100 lb.; cement coated nails, \$2.40 per keg.

Bolts, Nuts and Rivets.—Hesitancy on the part of buyers has become more pronounced as election has drawn near. Bolt and nut discounts appear to be holding, but on small rivets 70, 10 and 5 off, Chicago, is an increasingly general quotation. For complete mill prices see pages 1238 and 1239.

Jobbers quote structural rivets, 3.65c.; boiler rivets, 3.85c.; machine bolts up to $\frac{1}{2}$ x 4 in., 60 per cent off; larger sizes, 60 off; carriage bolts up to $\frac{1}{2}$ x 6 in., 55 off; larger sizes, 55 off; hot pressed nuts, squares and hexagons, tapped, 34 off; blank nuts, 34 off; coach or lag screws, gimlet points, square head, 65 per cent off.

Rails and Track Supplies.—The Missouri Pacific has placed 30,000 tons of rails for 1925, divided as follows: 10,000 tons to Illinois Steel Co., 10,000 tons to Inland Steel Co., 8000 tons to Tennessee Coal, Iron & Railroad Co. and 2000 tons to the Colorado Fuel & Iron Co. The Chesapeake & Ohio is expected to close for an equal tonnage this week. Orders for track supplies have also been liberal. During the week a local mill has booked a total of 12,000 tons of angle bars and 15,000 kegs of spikes and bolts.

Standard Bessemer and open-hearth rails, \$43: light rails, rolled from billets, 1.80c. to 1.90c., f.o.b. makers' mill.

Standard railroad spikes, 2.80c. mill; track bolts with square nuts, 3.80c. mill; steel tie plates, 2.30c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.45c. base, and track bolts, 4.45c. base.

Cast Iron Pipe.—Prices show no change for the better and the volume of new business is light. Hammond, Ind., takes bids Nov. 5, on 110 tons of 6 and 12-in. Akron, Ohio, took figures Oct. 31, on 130 tons of 6 to 16-in.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$52.20 to \$54.20; 6-in. and over, \$48.20 to \$50.20; Class A and gas pipe, \$5 extra.

Reinforcing Bars.—It is estimated fully 15,000 tons of concrete bars will be placed before Nov. 15 when most outstanding quotations will be withdrawn. Some low quotations are still outstanding against pending jobs, but on new business 2.25c. Chicago, warehouse, appears to be a minimum figure and most dealers are asking 2.50c., or \$10 a ton above the mill price. This margin, it is said, is a narrow one, being only one-half the usual charge of general jobbers in finished iron and steel. The 2.50c. quotation is still untested, however, and until it proves more than an asking price the market must be considered as remaining at 2.10 to 2.25c.

Lettings include:

Plymouth Refrigerating Co., cold storage plant, Plymouth, Wis., 300 tons to American System of Reinforcing.

Catholic Academy, Ottumwa, Iowa, 200 tons to American System of Reinforcing.

Theater building, Joliet, Ill., 300 tons to American System of Reinforcing.

Gas and Electric Co. building, Hammond, Ind., 100 tons to American System of Reinforcing.

Sanitary District of Chicago, north side sewers, 1000 tons to Olney J. Dean & Co.

South Water Street improvement, first section, Chicago, 820 tons to Kalman Steel Co.

United Masonic Temple building, Chicago, 500 tons to Olney J. Dean & Co.

Apartment building, Chicago, 500 tons to American System of Reinforcing.

John R. Thompson garage building, Chicago, 330 tons to Concrete Steel Co.

Sanitary District of Chicago, north side sewers, 200 tons to Concrete Steel Co.

H. W. Caldwell & Sons Co., plant building, Chicago, 100 tons to Joseph T. Ryerson & Sons.

Oak Park high school addition, Oak Park, Illinois, 110 tons to Concrete Steel Co.

Cicero telephone exchange, Cicero, Ill., 130 tons to Concrete Steel Co.

Steel Pipe.—Notwithstanding the persistent tendency to confine orders to immediate requirements, new business is in good volume. More liberal contracting is expected after election. The Youngstown Sheet & Tube Co. has increased its discounts on rigid conduit pipe three points, which is equivalent to a reduction of approximately \$6 a ton. Both the Evanston, Ill., and Pittsburgh base prices are affected, the Evanston base being two points lower than the Pittsburgh base discount. The Chicago delivered discount is 2½ points lower than the Pittsburgh discount. Conduit pipe is not manufactured by the National Tube Co., the Steel Corporation subsidiary.

Alloy Steel Bars.—A local mill is quoting alloy steel at Chicago base prices, which are \$2 a ton higher than the Pittsburgh base prices published on page 1239. This means that Chicago consumers are able to buy at \$4.80 less per ton than if they placed their business at the Pittsburgh base prices plus the freight. Trade in alloy steel bars is better than it was earlier in the year, but it still leaves much to be desired.

Old Material.—Although consumer buying during the week has been confined largely to low phosphorus grades and iron mill scrap, sentiment is increasingly optimistic. Dealers feel that materially better consumption lies just ahead and they are backing up this belief by paying advancing prices for scrap offerings. Railroad lists include the Chicago & North Western, 5600 tons; the Pere Marquette, 2500 tons; the Pennsylvania, 36,000 tons; the New York Central, 13,000 tons; the Michigan Central, the Erie and the Big Four, blind lists.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton
Iron rails	\$18.00 to \$18.50
Cast iron car wheels	18.00 to 18.50
Relaying rails, 55 and 60 lb.	26.00 to 27.00
Relaying rails, 65 lb. and heavier	27.00 to 32.00
Forged steel car wheels	19.50 to 20.00
Railroad tires, charging box size	20.00 to 20.50
Railroad leaf springs, cut apart	18.50 to 20.00
Rails for rolling	17.75 to 18.25
Steel rails, less than 3 ft.	18.50 to 19.00
Heavy melting steel	16.50 to 17.00
Frogs, switches and guards cut apart	17.25 to 17.75
Shoveling steel	16.25 to 16.75
Drop forge flashings	12.00 to 12.50
Hydraulic compressed sheets	13.50 to 14.00
Axle turnings	14.50 to 15.00
Steel angle bars	18.00 to 18.50
Steel knuckles and couplers	18.50 to 19.00
Coil springs	20.50 to 21.00
Low phos. punchings	18.00 to 18.50
Machine shop turnings	9.50 to 10.00
Cast borings	12.00 to 12.50
Short shoveling turnings	12.00 to 12.50
Railroad malleable	18.50 to 19.00
Agricultural malleable	17.50 to 18.00

	Per Net Ton
Iron angle and splice bars	17.00 to 17.50
Iron arch bars and transoms	19.00 to 19.50
Iron car axles	25.00 to 25.50
Steel car axles	17.50 to 18.00
No. 1 busheling	18.00 to 18.50
No. 2 busheling	8.50 to 9.00
Pipes and flues	11.50 to 12.00
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	14.75 to 15.25
No. 1 machinery cast	17.50 to 18.00
No. 1 railroad cast	16.50 to 17.00
No. 1 agricultural cast	16.50 to 17.00
Locomotive tires, smooth	16.50 to 17.00
Stove plate	14.50 to 15.00
Grate bars	14.50 to 15.00
Brake shoes	14.50 to 15.00

Lloyd's Register of Shipping for 1923-24 shows a number of changes in special types of ships available for service in various parts of the world. Oil tankers have increased between July, 1914, and July, 1924, from 1,478,988 to 5,243,238 gross tons. Steamers fitted for burning oil fuel have increased in the same period from 1,310,209 to 17,154,072 gross tons. Motor ships during that period have increased from 234,287 to 1,975,798 gross tons. All of this shows a definite trend away from coal to oil as a fuel.

New York

Large Order for Tin Plate—Good Tonnage of Pig Iron Pending

NEW YORK, Nov. 3.—The principal transaction of the week was the buying of 500,000 base boxes of tin plate by oil companies for export, and next in importance was the awarding of a contract for 8500 tons of structural shapes to the Hay Foundry & Iron Works for a 17-story loft building at No. 1 Park Avenue. Some railroad buying has been done, as mentioned elsewhere.

On the whole, the market is quiet and interest centers in speculation as to what will come after the election. The prevailing opinion among those of long experience is that there will be a very comfortable increase in orders after the election and some very definite promises of heavy buying have been made. But a rush of orders is not expected or even desired by those who prefer to see a steady improvement in business rather than a large increase in orders. One of the most important independents reports that October was its best month in a long period, but states that orders declined sharply toward the close of the month. One unfavorable feature of the situation is that buyers require constant prodding and the orders that are coming to the steel companies unsolicited are few and, as a rule, of not large tonnages. Likewise, specifications against contracts are being received slowly.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c.; plates, 1.94c. to 1.99c.; structural shapes, 2.14c. to 2.24c.; bar iron, 2.34c.

Pig Iron.—It is estimated that at least 35,000 tons of inquiry is current in the pre-election market, with considerable activity evident from radiator and heating equipment manufacturers, and there is reason for believing that inquiry not made public will increase the total to not less than 50,000 tons. Eastern Pennsylvania furnaces are holding firmly at \$20.50 per ton base for delivery in the current quarter with \$21 per ton quoted by a few and the \$21 price general for first quarter iron. Most of the present interest is in iron for first quarter delivery and in addition to actual inquiries from large consumers the smaller purchasers are reported by sellers to be feeling out the market. A fair degree of activity in Michigan charcoal iron is reported, sellers holding firmly to the \$26 base. One of the large inquiries now current for No. 2 plain and 2X totals 12,000 tons from a radiator manufacturer. A furnace company in New Jersey is asking for 4000 tons for first quarter and a cast iron pipe producer is in the market for 2000 tons for one plant. A local New Jersey foundry is in the market for 800 tons of No. 2 plain and 2X for second quarter delivery, but as yet sellers are not manifesting much interest in such advanced business. It is claimed by some sellers that while they are adhering to the 50c. differential between No. 2 plain and No. 2X, they are making an effort to advance the differential to \$1 and in some cases \$1.50 between 2X and 1X iron.

We quote delivered in the New York district as follows, having added to furnace price \$2.27 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 2, sll. 1.75 to 2.25.	\$22.27 to \$22.77
East. Pa. No. 1X fdy., sll. 2.75 to 3.25	23.27 to 23.77
East. Pa. No. 2X fdy., sll. 2.25 to 2.75	22.77 to 23.27
Buffalo, sll. 1.75 to 2.25	23.41 to 23.91
No. 2 Virginia, sll. 1.75 to 2.25...	29.94 to 30.44

Ferroalloys.—Extreme dullness pervades the ferromanganese market, but prices are firm at \$100, seaboard basis. Because of the advance in sterling exchange, higher prices are looked for if this continues. Business is sporadic and confined to small and carload lots. Sales of about 500 tons in small and carload lots of spiegeleisen are reported during the week.

Cast Iron Pipe.—Purchasing by the City of New York continues to contribute some activity to the mar-

ket. Makers are well sold ahead and prices fairly firm. A recent contract let by the Department of Water Supply, Gas and Electricity, City of New York, involving 2700 tons of 20-in., 30-in. and 36-in. high pressure pipe, went to the Beaver Engineering Co. and the pipe was awarded to the Warren Foundry & Pipe Co. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$55.60 to \$56.60; 4-in. and 5-in., \$60.60 to \$61.60; 3-in., \$70.60 to \$71.60, with \$5 additional for Class A and gas pipe. Jobbers of soil pipe show considerable interest in material at the current discounts, which are widely diversified. Makers complain that the low prices now being quoted represent doing business at a loss and are unwilling to contract far ahead. Discounts quoted are largely nominal, the price obtainable varying with the tonnage offered and the circumstances. We quote discounts of both Northern and Southern makers, f.o.b. New York, as follows: 6-in., 47½ to 57½ per cent off list; heavy, 57½ to 67½ per cent off list.

Warehouse Business.—Excepting non-ferrous products, conditions remain virtually unchanged. Galvanized sheets are strong, black sheets very weak and bars spotty, considerable price cutting by small dealers on bars being still in evidence. There is a fair amount of transactions in structural material. In all these products prices hold at last week's levels. Stocks are regarded as well below normal and the mill position softened last week. One dealer urges that if mills are found reluctant to take some orders it must not be assumed that they are rushed, but rather that they are loath to change rolls for small commitments. Preliminary reports from several houses show October business was more satisfactory than September.

Coke.—Consumers show slightly more interest in accumulating stocks and the market is holding more firmly to quoted prices of \$4.25 to \$4.75 per ton for standard foundry and \$3.25 to \$3.50 per ton for standard furnace. By-product continues in fair demand at \$10.41, Newark or Jersey City, N. J.

Old Material.—The market is marking time on practically all grades. Shipments in fulfillment of contracts are being made by brokers, but few new orders are being placed. There is a well defined tendency among dealers with yards to refrain from disposing of materials until the effect on business of the election is known. No. 1 heavy melting steel is unchanged at \$16 to \$17, delivered eastern Pennsylvania, the buying prices of brokers. There is some activity in machine shop turnings, which are going forward to Harrisburg at \$13.50 and to Phoenixville at \$13, the prices paid by brokers with contracts. Clean cast borings are quoted at about \$13.50, delivered eastern Pennsylvania consumers, while cast borings for chemical plants are quoted by brokers at \$16 delivered to a consumer with a freight rate of \$2.25, making the price about \$13.75 per ton, New York. Specification pipe is \$16 per ton, delivered to an eastern Pennsylvania consumer. Stove plate is weak with \$14.50 per ton being paid, delivered to a consumer in Harrisburg, and about \$13.75, delivered to a New Jersey foundry with a freight rate of \$2.02 per ton.

Buying prices per gross ton New York follow:		
Heavy melting steel, yard.....	\$12.00	\$12.50
Heavy melting steel, railroad or equivalent	12.75 to	13.25
Rails for rolling.....	14.50 to	15.00
Relaying rails, nominal.....	24.00 to	25.00
Steel car axles.....	18.00 to	18.50
Iron car axles.....	26.00 to	28.00
No. 1 railroad wrought.....	14.50 to	15.00
Forge fire	9.75 to	10.25
No. 1 yard wrought, long.....	13.50 to	14.00
Cast borings (clean).....		9.75
Machine shop turnings.....	9.25 to	9.75
Mixed borings and turnings.....	9.25 to	9.75
Iron and steel pipe (1 in. diam., not under 2 ft. long).....		12.25
Stove plate	11.00 to	11.75
Locomotive grate bars.....	11.50 to	12.50
Malleable cast (railroad).....	14.00 to	14.50
Cast iron car wheels.....	14.50 to	15.00
No. 1 heavy breakable cast.....	11.75 to	12.25

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:	
No. 1 machinery cast.....	\$16.00 to \$16.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.)	13.00 to 13.50

Buffalo

Important Company in Market for 50,000 Tons of Pig Iron

BUFFALO, Nov. 3.—The pig iron market is featured by the action of one large consumer in asking figures on approximately 50,000 tons of iron, principally foundry grades, for delivery over the rest of this year and part of the first. It is understood that no action has yet been taken in closing this business. In addition, an aggregate of 20,000 to 25,000 tons is offering. An implement maker wants to place 2000 tons of foundry for the first quarter and a New Jersey melter desires to buy 2000 tons for the first quarter. Two inquiries for 1500 tons each of foundry are out and three inquiries for 1000 tons each are up for figures. One interest sold an aggregate of 7000 tons for the week, and another sold 5000 to 6000 tons. While it is thought that not much has been sold for the last quarter at a price over \$19, it is the general disposition of most furnaces now not to quote on what capacity they have left at under \$19.50. Furnaces are not actively seeking new business even at \$19.50, expecting higher levels to obtain within a short time. Where first quarter shipment is being negotiated, quotations are being made on a basis of \$19.50 for foundry and malleable, though there is at least one instance of a local furnace quoting \$19.50 on 2.25 to 2.75 silicon foundry. The stack of the Tonawanda Iron Corporation is now producing. The output of this stack will be for the Buffalo and Titusville plants of the American Radiator Co.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25....	\$19.00 to \$19.50
No. 1 foundry, sil. 2.75 to 3.25....	20.00 to 21.00
No. 2 foundry, sil. 2.25 to 2.75....	19.50 to 20.00
Malleable, sil. up to 2.25.....	19.00 to 19.50
Basic	19.00 to 19.50
Lake Superior charcoal.....	29.28

Finished Iron and Steel.—General business is very much better, but there is nothing spectacular about the market. The usual pre-election lull seems to be breaking with a better volume of small orders. Bar business is not brisk but the 2.265c. price seems to be well maintained, though some of the jobbers may be doing a little better. It is generally recognized that present prices on bars, and structural shapes are approximately about cost of production and plate prices represent a substantial loss to manufacturers. Sheet business is better and mills in this district, as well as mills which sell their product here, increased operations. One seller of sheets sees a firmer price tendency, though the black is still around 3.40c. and the galvanized price around 4.50c. On some sheet business, there is as great a range as \$4 a ton between selling prices. Among the recent orders taken was one for 300 tons of black. Structural fabricators say many small lots are being offered, most of them closing about 200 tons a week of this kind of business.

Steel bars, 3.30c.; iron bars, 3.35c.; reinforcing bars, 3.30c.; structural shapes, 3.40c.; plates, 3.40c.; No. 10 blue sheets, 4.05c.; No. 28 black sheets, 4.75c.; No. 28 galvanized sheets, 5.85c.; bands, 4.05c.; hoops, 4.40c.; cold-finished rounds, 4.2c.; cold-finished shapes, 4.70c.

Old Material.—Two of the Buffalo mills are buying small lots of heavy melting steel and hydraulic compressed, but no large inquiries are out. Dealers do not look for the market to go much higher this year, though increases may be effective after the first of the year when mills having consumed their lower-priced raw material, begin making steel at a higher price. Some heavy melting steel has been sold at \$17.50, and dealers think this may even go to \$18, but not above that. It is believed that tonnage could be had by the mills between \$17 and \$18. One mill has been getting considerable heavy melting steel by barge canal shipment from the Hudson River Valley and still has about 5000 tons to come. This has contributed to hold prices down on rail shipment. Mills are operating at a higher rate

of production than for some time. There is little demand for the specialty scraps.

We quote f.o.b. gross ton, Buffalo, as follows:	
Heavy melting steel	\$17.00 to \$17.50
Low phosphorus, 0.04 and under	19.50 to 20.00
No. 1 railroad wrought.....	15.00 to 16.00
Car wheels	16.00 to 17.00
Machine shop turnings	12.00 to 12.50
Cast iron borings	12.00 to 13.00
No. 1 busheling	15.50 to 16.00
Stove plate	15.00 to 15.50
Grate bars	14.50 to 15.00
Bundled sheets	12.00 to 12.50
Hydraulic compressed	16.00 to 16.50
Railroad malleable	17.50 to 18.00
No. 1 machinery cast.....	17.00 to 17.50

St. Louis

Increased Inquiry for Pig Iron—Scrap Market Is Stronger

ST. LOUIS, Nov. 3.—In anticipation of the results of the election, inquiries involving between 18,000 and 20,000 tons of pig iron in lots of from 200 tons to 10,000 tons, in addition to numerous requests for quotations on carload lots, were placed before the market during the past week. These inquiries and the generally expressed intention of melters of pig iron to withhold the placing of orders until after the election have given the pig iron market a firm tone, although prices are unchanged. Of the definite inquiries, 10,000 tons for first quarter delivery are to be equally divided between Missouri and central Illinois plants of one manufacturer. A melter in the district wants 1000 tons of foundry iron for first quarter delivery and 2000 tons inquired for is in lots of from 200 to 500 tons. Another local melter wants 6000 tons of basic for first quarter delivery. The St. Louis Coke & Iron Co. reports the sale of 7500 tons of foundry iron in lots of 150 tons upward, the largest being 1500 tons to a St. Louis melter. A leading Southern interest sold about 1000 tons, mostly for water and rail shipment, from Florence, Ala.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$2.28 from Florence and Sheffield (rail and water), \$5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., all. 1.75 to 2.25....	\$22.66 to \$23.16
Northern malleable, sil. 1.75 to 2.25.....	22.66 to 23.16
Basic	22.66 to 23.16
Southern fdy., sil. 1.75 to 2.25 (rail)	22.67 to 23.67
Southern fdy., sil. 1.75 to 2.25 (rail and water)	20.78 to 21.78
Granite City iron, sil. 1.75 to 2.25.....	22.81 to 23.81

Finished Iron and Steel.—There are rumors of advances that are to be made, but such rumors have caused no change from the usual hand-to-mouth policy that has prevailed for some time. An Arkansas fabricator has closed on 250 tons of structural material for stock. The Laclede Steel Co. has booked 150 tons of billet reinforcing bars for a warehouse in Shreveport, La. Pending reinforcing bar business includes the Ouachita Hotel, Monroe, La., 200 tons, and the Montgomery Ward Building, Kansas City, 600 tons. Warehouses report a fair business.

For stock out of warehouse we quote: Soft steel bars, 3.25c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled one pass, 5c.; cold-rolled rounds, shafting and screw stock, 4.15c.; structural rivets, 3.90c.; boiler rivets, 4.10c.; tank rivets, 7/8-in. and smaller, 6c. per cent off list; machine bolts, 55 and 5 per cent; carriage bolts, 40 and 5 per cent; lag screws, 60 and 5 per cent; hot pressed nuts, squares or hexagons, blank or tapped, \$2.50 off list.

Coke.—The demand for metallurgical coke is holding its own, but domestic grades are rather dull as a result of the unseasonably warm weather prevailing for the past two weeks. A central Illinois consumer has bought 20 to 25 cars of Terre Haute by-product coke.

Old Material.—The market for old material is stronger, but the strength is based alone on the faith of dealers. Consumers are willing to buy only at concessions, and the prices paid by dealers are more than consumers will pay. Dealers firmly believe that there will be heavy buying after the election and have been

taking all material offered. A sudden demand arose during the last week for No. 1 railroad wrought, and dealers advanced the price on this \$1.50 a ton. The largest railroad list issued during the week was from the Pennsylvania System, 40,000 tons, of which 12,000 tons were steel grades and 6000 tons foundry grades. There also was a blind list from the Big Four Lines and 600 tons from the Frisco.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	\$16.00 to \$16.50
Rails for rolling	16.50 to 17.00
Steel rails less than 3 ft.	18.50 to 19.00
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 lb. and over	32.50 to 33.50
Cast iron car wheels	16.00 to 16.50
Heavy melting steel	14.50 to 15.00
Heavy shoveling steel	14.50 to 15.00
Frogs, switches and guards cut apart	15.75 to 16.25
Railroad springs	18.00 to 18.50
Heavy axles and tire turnings	12.00 to 12.50
No. 1 locomotive tires	16.50 to 17.00

Per Net Ton

Steel angle bars	14.50 to 15.00
Steel car axles	19.00 to 19.50
Iron car axles	24.00 to 24.50
Wrought iron bars and transoms	18.25 to 18.75
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	13.00 to 13.50
Cast iron borings	10.75 to 11.25
No. 1 busheling	12.50 to 13.00
No. 1 railroad cast	17.00 to 17.50
No. 1 machinery cast	17.50 to 18.00
Railroad malleable	14.00 to 14.50
Machine shop turnings	7.00 to 7.50
Champion bundled sheets	8.00 to 8.50

Birmingham

Southern Blast Furnaces to Be Blown—Cast Iron Pipe Outlook Improved

BIRMINGHAM, ALA., Nov. 3.—Confident that there will be increased demand in the near future, Southern furnace interests are beginning to give some attention to the future production, in brief, plans are now being made to repair furnaces for later operation. The small-lot business still obtains, but there is evidence of a turning point. Expectations are that within another few days an upward trend will be noted and by the turn of the year there will be need for a greater output. Two blast furnaces have been in readiness for some time in this State to receive the torch. Work will be started this week on repairing one of the furnaces in the city limits, to have it ready within 60 days and in the next week or two relining of another furnace will be started on so that next year early the make can be materially increased. Quotations this week continue at \$18 minimum, No. 2 foundry, with the machine-cast iron pipe, a small tonnage daily, being sold at \$19.

Steel.—Steady operation of steel mills and satisfactory conditions at fabricating plants so far as operations go indicate that the steel market conditions in this section are favorable. That there has been some fluctuation in prices is evident and that consumers are anticipating higher prices is also to be heard. Steel bars (soft) quoted at 2.05c. to 2.15c., Birmingham.

We quote per gross ton, f.o.b. Birmingham district furnace, as follows:

No. 2 foundry, 1.75 to 2.25 sll	\$17.50 to \$18.50
No. 1 foundry, 2.25 to 2.75 sll	18.00 to 18.50
Basic	18.50 to 19.00
Charcoal, warm blast	30.00 to 31.00

Pipe.—No change announced in cast iron pipe market condition in this district, lettings still coming in with prices holding firm. Considerably better feeling is noted among Alabama cast iron pipe producers by reason of interviews given out by J. R. McWane, president McWane Cast Iron Pipe Co., on his return from the Pacific Coast, where he called on selling agencies and the trade, taking in a number of orders. It was ascertained by Mr. McWane that French and Belgian cast iron pipe which a year ago threatened competition with the Alabama product had not come up to all ex-

pectations and was not giving entire satisfaction. However, much foreign pipe is still finding its way to the Pacific Coast. All gas and water pipe-making plants here are operating practically to capacity.

Coke.—Further improvement in coke market is announced with shipments somewhat better, quotations firmer though not advancing. The range in quotations is from \$4.50 to \$5 per ton for foundry coke with \$4.50 maximum on furnace coke.

Old Material.—No improvement is noted in the scrap iron and steel market, the trade is dull, consumers buying just as their needs, a few tons at a time, appear. The quotations are weak and readjustments are noted. Heavy melting steel has not been so quiet as at present for a very long time. Dealers are not expecting any change for the better this year yet. No speculative buying is being done.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Cast iron borings, chemical	\$15.00 to \$16.00
Heavy melting steel	12.00 to 12.50
Railroad wrought	12.00 to 13.00
Steel axles	17.00 to 18.00
Iron axles	19.00 to 19.50
Steel rails	12.50 to 13.00
No. 1 cast	14.00 to 15.00
Tram car wheels	15.00 to 16.00
Car wheels	14.00 to 15.00
Stove plates	13.50 to 14.00
Machinist shop turnings	6.00 to 7.00
Cast iron borings	7.00 to 8.00
Rails for rolling	15.00 to 16.00

Boston

Little Pig Iron Business Transacted—Some Buying of Indian and Continental Irons

BOSTON, Nov. 3.—Comparatively little business was transacted in the local pig iron market the past week, due to the hesitancy on the part of buyers and furnaces to commit themselves until the outcome of the Presidential election became known. There is, however, a sizable inquiry, mostly for small tonnages, for first quarter 1925 iron. In the aggregate they run well up into four figures. Some business was lost the past week by Buffalo furnaces because of a pinch in supplies of iron of certain analysis at the furnace. The price situation is practically unchanged. The most active Buffalo furnace in this district is quoting No. 2 plain iron for 1924 delivery at \$20 furnace, No. 2X at \$20.50, and No. 1X at \$21.50, and No. 2 plain for first quarter 1925 delivery at \$19, No. 2X at \$19.50 and No. 1X at \$21. The unusual spread between No. 2X and No. 1X iron clearly indicates the sold up condition of the latter. Eastern Pennsylvania iron generally is quoted at \$21 furnace base. The absence of large tonnages in the market possibly accounts for the stability of prices. Western Pennsylvania and Alabama irons continue to sell at prices considerably out of line with Buffalo and eastern Pennsylvania, but foundries apparently are willing to pay a premium in order that certain mixture formulas may be maintained. India iron at around \$24 delivered and high phosphorus Continental at \$22 on cars, Boston, figure in recent transactions. Several hundred tons of Norway iron is reported to have been sold here recently.

We quote delivered prices on the basis of the latest reported sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	\$24.65 to \$25.15
East. Penn., sil. 2.25 to 2.75	25.15 to 25.65
Buffalo, sil. 1.75 to 2.25	23.91 to 24.41
Buffalo, sil. 2.25 to 2.75	24.41 to 24.91
Virginia, sil. 1.75 to 2.25	29.42 to 29.92
Virginia, sil. 2.25 to 2.75	29.92 to 30.42
Alabama, sil. 1.75 to 2.25	27.10 to 27.60
Alabama, sil. 2.25 to 2.75	27.60 to 28.10

Cast Iron Pipe.—The market for cast iron pipe has eased off another \$1 a ton, bringing 6-in. to 16-in. Class B and heavier pipe down to \$59.10 delivered Boston common rate points; 20-in. and larger down to \$58.10; and 4-in. down to \$64.10. The usual \$5 differential is asked on Class A and gas pipe. Little interest is shown in heavy pipe, but several municipalities intimate they shortly will be in the market for material

to be delivered during the winter. One of New England's largest gas companies is in the market for a considerable tonnage of gas pipe for 1925 delivery.

Coke.—Both the New England Coal & Coke Co. and the Providence Gas Co. have announced that the contract price of by-product foundry coke for November shipment will be \$11.50, the same as for October shipment. These producers made a substantial gain last month, contrasted with September, in foundry coke shipments, and November is starting off better than October did. According to present plans they will open their books for first half 1925 contracts on or about Friday, Nov. 7.

Old Material.—Purchases of old material have tapered off once more. With the dullness has come a slight shading of prices on those materials most active of late, notably machine shop turnings, chemical borings, mixed borings and turnings and shafting. In contrast, light buying of heavy melting steel for Pittsburgh district delivery has stiffened the market somewhat. Even at the better prices, comparatively little material is coming on the market, because holders expect higher prices this week. Heavy section rails for rerolling are about 50c a ton higher at \$14, while lighter ones are worth around \$13.50. The market is practically bare of old pipe orders and prices are off about 50c. a ton on the average. New England foundries continue interested in No. 1 machinery cast at around \$19, delivered, but owners of such material are not particularly anxious to sell. The market for stove plate is listless and quotations are largely nominal.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast.....	\$18.00 to \$19.00
No. 2 machinery cast.....	15.00 to 16.00
Stove plates.....	14.00 to 14.50
Railroad malleable.....	17.00 to 17.50

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$12.00 to \$13.00
No. 1 railroad wrought.....	13.00 to 13.50
No. 1 yard wrought.....	12.00 to 12.50
Wrought pipe (1-in. in diam., over 2 ft. long).....	11.00 to 11.50
Machine shop turnings.....	8.50 to 9.00
Cast iron borings, chemical.....	11.50 to 12.00
Cast iron borings, rolling mill.....	8.50 to 9.00
Blast furnace borings and turnings.....	8.50 to 9.00
Forged scrap and bundled skeleton.....	9.00 to 9.50
Shafting.....	15.50 to 16.00
Street car axles.....	15.50 to 16.00
Rails for rolling.....	13.50 to 14.00

Cleveland

Increased Activity in Pig Iron and Finished Materials—Prices Show Little Change

CLEVELAND, Nov. 3.—The steel bar market has become more active. Many consumers, evidently anticipating a favorable result of the election and better business conditions thereafter, are not waiting until the result is known before they place their orders. The same influence is apparently affecting the pig iron market, as there has been an increase in activity in pig iron the past week and some of the largest consumers have come in the market.

Mills booked a fairly heavy volume of steel bar orders during the week. Among these were several lots for 1000 tons. Buyers included bolt and nut and rivet manufacturers and automobile spring and forging manufacturers. The firming up of the steel bar market is doubtless the cause of bringing out some of the tonnage. Prospective buyers seem to feel that a buying spurt in a few days would result in a price advance and asked for and secured protection on steel bars at 2c., Pittsburgh, until Jan. 1. Outside of steel bars, the finished material market continues quiet, with buyers placing orders for material needed for early requirements.

Pig Iron.—Sales and inquiry increased during the week and a fairly active buying movement in foundry and malleable iron appears under way for the first quarter, with some consumers inquiring for the entire

first half. Sales aggregating 20,000 to 25,000 tons were made by local interests during the week and new inquiries came out aggregating at least 50,000 tons. The American Radiator Co. is inquiring for 25,000 tons for its various plants, including Detroit and Springfield, Ohio, and the New York Air Brake Co. for 5500 tons. The most active market is in western Ohio and in Indiana, from where a large share of the inquiry has come. One inquiry is from the Link-Belt Co., Indianapolis, for 3000 tons of malleable iron. A Muncie, Ind., company purchased 1500 tons of malleable iron. Very little inquiry is coming from the automobile industry. Two or three purchases were made subject to confirmation after election, and much of the pending inquiry will probably remain open until after the ballots are counted. In addition to the demand for next year there is fair volume of business in small lots covering requirements for the remainder of this year. While no general inquiries are pending for basic iron, one steel maker is figuring on a round tonnage. The increased activity has not resulted in any stiffening in prices, which are unchanged. The Lake furnace price on foundry and malleable iron is \$20, but for outside shipment from Cleveland the price depends considerably on competition at the point of delivery. In the Valley district \$19.50 appears to be the more common price, although some business is still being taken at \$20 and makers report a price as low as \$19.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$2.02 freight rate from Jackson and \$6 rate from Birmingham:

Basic, Valley furnace.....	\$19.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25.....	21.00
Southern fdy., sil. 1.75 to 2.25.....	\$23.51 to 24.00
Malleable.....	21.00
Ohio silvery, 8 per cent.....	21.52
Stand. low phos., Valley furnace..	28.00 to 28.75

Bolts, Nuts and Rivets.—The leading local rivet manufacturer who recently adopted Cleveland as a basing point in addition to Pittsburgh, has now entirely abandoned the Pittsburgh basing point and is quoting either f.o.b. Cleveland or Chicago. This change will tend to localize the rivet business, for, with only a Cleveland base, local rivet makers will not have much chance to compete in the Pittsburgh territory with manufacturers in that territory. While the Cleveland base price is 2.60c., quotations up to 2.65c. and 2.75c. are being made for delivery to certain Central Western points including southern Ohio and parts of Indiana. The bolt and nut market is firm with a fair volume of specifications on contracts.

Steel Bars, Plates and Structural Material.—Efforts to put shapes and bars on a 2c., Pittsburgh base, a \$2 a ton advance over the recent minimum, appear to have been successful, as independent mills are now holding to that price, or 2.10c., Cleveland. Plates continue weak with quotations ranging from 1.80c. to 1.90c., Pittsburgh, but the former has become a more common price and is being quoted for small lots.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.35c.; No. 28 galvanized sheets, 5.45c.; No. 10 blue annealed sheets, 2.45c. to 3.60c.; cold-rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage and heavier, 3.85c.; narrower than 1 in., all gages, 4.35c.; No. 9 annealed wire, \$3.05 per 100 lb.; No. 9 galvanized wire, \$3.50 per 100 lb.; common wire nails, \$3.35 base per 100 lb.

Hot-Rolled Strips.—The market on wide strip continues weak with prices ranging from 2.10c. to 2.15c., Pittsburgh. Bands range from 2.35c. to 2.40c. and hoops are steady at 2.50c., Pittsburgh.

Sheets.—The sheet market is slow with consumers buying only what they actually need. Without orders large enough to furnish a real test, prices are fairly well maintained at 3.40c. to 3.50c., Pittsburgh for black sheets, 2.60c. blue annealed and 4.50c. to 4.60c. for galvanized.

Semi-Finished Steel.—Specifications are fair, but there is no new inquiry and prices are untested. Nominal quotations are \$37.50, Cleveland, and \$37, Young-

town, on sheet bars and \$37, Cleveland, and \$35.50, Youngstown, on rolling billets and slabs.

Reinforcing Bars.—Competition has resulted in further price concessions on rail steel bars and on these quotations of 1.80c. at mill have appeared, or a decline of \$2 a ton.

Iron Ore.—Shipments of Lake Superior ore during October amounted to 5,596,648 tons. The movement for the season to Nov. 1 was 40,558,325 tons, a decrease of 25 per cent as compared with the same period last year. Shipments by water this year are expected to amount to 42,500,000 to 43,000,000 tons as compared with the 59,000,000 tons last year.

Old Material.—The market is pretty much at a standstill, as buyers and sellers are waiting until after election. There was a limited amount of trading among dealers during the week and owing to disinclination to sell prices were forced up 25c. a ton on most grades and as much as 75c on borings. Considerable scrap is being offered by railroads in lists that close this week. The New York Central has a list of 15,000 tons, the Pere Marquette 2100 tons, and the Big Four and Michigan Central and Pennsylvania have issued blind lists. The Trumbull Steel Co., Warren, has released shipments on scrap which have been held up for some time.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	\$15.75 to \$16.00
Rails for rolling	16.00 to 16.25
Rails under 3 ft.	17.00 to 17.50
Low phosphorus melting.....	18.50 to 19.00
Cast iron borings	14.00 to 14.25
Machine shop turnings	13.25 to 13.50
Mixed borings and short turnings	13.75 to 14.00
Compressed sheet steel	13.50 to 13.75
Railroad wrought	13.75 to 14.00
Railroad malleable	18.25 to 18.50
Light bundled sheet stampings	12.75 to 13.00
Steel axle turnings	14.25 to 14.75
No. 1 cast	18.75 to 19.00
No. 1 busheling	13.25 to 13.50
Drop forge flashings	11.50 to 12.00
Railroad grate bars	13.50 to 14.00
Stove plate	13.50 to 14.00
Pipes and flues	11.50 to 12.00

Cincinnati

Pig Iron Purchased in Fair Sized Tonnages— Silvery Shaded

CINCINNATI, Nov. 3.—There was more activity in the pig iron market last week, some fair-sized tonnages being bought, principally by malleable foundries. The Link-Belt Co. closed for 2000 tons and a Muncie, Ind., melter for 1500 tons, both orders being placed with Lake front furnaces. A Tennessee melter bought 1000 tons of malleable from an Ironton district furnace for first quarter shipment. Several other sales ranging from 400 tons to 1000 tons were made in the Cincinnati territory, orders in some cases being for last quarter, but the majority of the tonnages were for first quarter. There was more activity in silvery irons, one sale being for 500 tons for last quarter, while another was for 100 tons for first quarter. Bessemer and basic grades were quiet. Little activity was noted in Southern irons, the largest sale reported being 150 tons for first quarter. Prices generally are unchanged, but the market is steadier and with a favorable verdict at the polls it is expected that advances will be recorded in all markets. In southern Ohio prices range from \$20 to \$20.50, base, while in the South the range is from \$17.50 to \$18.50. Silvers are being quoted \$1.50 below schedule for prompt shipment, 8 per cent being offered at \$29, furnace.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton we quote f.o.b. Cincinnati:

Southern fdy., sil. 1.75 to 2.25 (base)	\$21.55 to \$22.05
Southern fdy., sil. 2.25 to 2.75... 22.05 to 22.55	
Southern Ohio silvery, 8 per cent 31.27 to 31.77	
Southern Ohio fdy., sil. 1.75 to 2.25	22.27
Southern Ohio, basic.....	21.77
Southern Ohio malleable.....	22.27

Finished Materials.—The market was very quiet during the past week, but indications point to more active buying after election, contingent on a favorable result. There is a large tonnage of this class of business in sight, and if it is all placed, the month of November will be one of the best this year. There is also a lot of inquiry for first quarter, but mills have not as yet opened books for this delivery. A local frog and switch company purchased a tonnage of light rails, bars and plates this week, and it is reported that previous low prices were shaded \$1 a ton, light rails being bought at 1.65c., plates at 1.75c. and bars at 1.90c., Pittsburgh. A steady demand for tubular products is reported, but wire products are inactive, though prices are steady. There is only a limited demand for shapes from jobbers and fabricators, orders running less than 100 tons on the average, and prices are steady at 1.90c. to 2c., Pittsburgh, for delivery in this territory.

Sheets.—Inquiry for first quarter is fairly good, but no business has been placed, as mills have not opened books. There is some intimation that first quarter prices will be named shortly after election, and that prices will be advanced from \$2 to \$3 per ton. However, no changes on current quotations have been made, and while 2.60c. for blue annealed, 3.50c for black and 4.50c. for galvanized are generally quoted, these prices have been cut, in the case of black sheets as much as \$3 per ton, and in black and galvanized, \$1 per ton. Some reports of contemplated advances have been heard in automobile body sheets, but the price of 4.65c. still holds for shipment during the rest of the year. There has been some inquiry for tin plate for first half, but as books have not been opened, no orders have been placed.

Structural Activity.—The Louisville & Nashville Railroad has issued an inquiry for 1200 tons for bridge work. The American Laundry Machinery Co. will rebuild part of its Rochester plant recently destroyed by fire, and is taking tentative bids on a structure requiring 1100 tons. The Big Four Railroad has placed orders for two girder spans and a turntable with McClintic-Marshall Co. and the American Bridge Co. The Dravo Contracting Co. is low bidder on 17 steel barges for the Mississippi River Commission involving 2100 tons.

Coke.—Demand for foundry coke is showing slight improvement. Domestic grades are also in better demand. Gas coke is fairly active, two sales made last week being for 8000 and 3000 tons respectively. Prices are steady and unchanged.

Old Material.—Better activity in the Valley market is reflected locally, and, while there has been little selling, prices are higher on buying orders. The increase averages 50c. per ton.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel.....	\$14.00 to \$14.50
Scrap rails for melting	12.50 to 13.00
Short rails	16.50 to 17.00
Relaying rails	29.00 to 29.50
Rails for rolling	14.50 to 15.00
Old car wheels	13.50 to 14.00
No. 1 locomotive tires	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Agricultural malleable	13.50 to 14.00
Loose sheet clippings	10.00 to 10.50
Champion bundled sheets	11.00 to 11.50

Per Net Ton	
Cast iron borings	9.50 to 10.50
Machine shop turnings	9.00 to 9.50
No. 1 machinery cast	18.00 to 18.50
No. 1 railroad cast	15.50 to 16.00
Iron axles	21.00 to 21.50
No. 1 railroad wrought	10.50 to 11.00
Pipes and flues	7.50 to 8.00
No. 1 busheling	10.00 to 10.50
Mixed busheling	8.00 to 8.50
Burnt cast	10.00 to 10.50
Stove plate	10.00 to 10.50
Brake shoes	11.50 to 12.00

Reinforcing Bars.—Pollak Steel Co. has taken 400 tons for the Alms Hotel, Cincinnati. This is the only important award. Inquiries continue for a fair aggregate tonnage, but most of them are for 100 tons and less. Prices are fairly steady, though reports are heard of 1.85c., mill, having been done on new billet steel. Prices range from 1.90c. to 2c. mill.

Warehouse Business.—Orders for small tonnages

continue in good volume, though buying of wire products has been rather light. Prices are firm.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds, 4.05c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, \$3.15 per 100 lb.; common wire nails, \$3.15 per keg base; cement coated nails, \$2.85 per keg.

Philadelphia

Pig Iron Prices Marked Up as Demand Becomes More Active

PHILADELPHIA, Nov. 3.—More active inquiries and sales of pig iron, involving both last and first quarter delivery, are easily the outstanding features that have developed in this market the past week. Inquiries for foundry iron calling for 1000 tons or more for first quarter delivery represent from 30,000 to 35,000 tons. Sales of basic iron also have been made in fair volume, some for last quarter and a portion for first quarter shipment. On the strength of this stimulated demand and purchase, asking prices have advanced, foundry iron to \$21, base, furnace, and basic iron to \$19.50 to \$20, furnace.

The market generally also continues to show moderate improvement, and the better feeling that set in recently promises to grow, provided the trade is satisfied with the outcome of the Presidential election, and some producers look for a firming up of prices in consequence. The upturn reflected is based on better inquiry for most lines which comes from miscellaneous sources. The scrap market also is somewhat stronger, with a few prices higher.

Pig Iron.—Stimulation has been given in a marked degree to the pig iron market as the result of inquiries and purchases the past week. Prices of Eastern foundry grades have been marked up 50c. a ton and of basic \$1 for both last and first quarter shipment. Eastern foundry now is quoted at \$21, base, furnace. Producers still are not quoting generally for first quarter delivery, but more of them have quoted for this shipment the past week. Inquiries for 1000 tons and more of foundry iron for first quarter shipment involve from 30,000 to 35,000 tons, while inquiries calling for smaller individual lots bring the total up substantially. Among inquiries pending is that of a prominent radiator company for 12,000 tons. Two leading soil pipe interests are seeking 7500 tons, while several stove foundries are seeking 500 to 1000 tons each. A great percentage of this iron is for delivery in the New York territory. The furnace interests naming first quarter prices have done so only on desirable inquiries from old customers, and those quoted, they state, may be withdrawn and higher ones named on future business. The largest sales of basic iron the past week involved one lot of 1000 tons at \$19.50 and the other 1300 tons at \$20, furnace, for both last and first quarter shipment. One selling interest now is quoting on first quarter basic iron at \$20, furnace, and the base grade of foundry iron at \$21.50, while No. 2X is quoted at the usual differential of 50c., but No. 1X is quoted at \$23.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25	
sl.	\$21.76 to \$22.63
East. Pa. No. 2X, 2.25 to 2.75	sl. \$22.26 to 23.12
East. Pa. No. 1X,	22.76 to 23.63
Virginia No. 2 plain, 1.75 to 2.25	
sl.	23.17 to 23.87
Virginia No. 2X, 2.25 to 2.75	sl. 28.67 to 29.17
Basic delivered eastern Pa.	21.00 to 22.00
Gray forge	21.00 to 22.00
Malleable	22.00 to 22.50
Standard low phos. (f.o.b. furnace)	23.50 to 24.00
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00

Plates.—While no change in the price of plates has developed the past week in this district, inquiries and orders have increased somewhat. The market still is weak, but the recent improvement which set in continues. Prices are 1.60c. to 1.65c., Pittsburgh. The American Locomotive Co. has taken 50 locomotives, calling for 1800 to 2000 tons of plates, from the Wabash Railroad. The C. & N. W. Railroad has put out an inquiry for repair work, involving boiler and fire boxes chiefly, on 50 locomotives.

Structural Material.—The market for structural material still lags. This is due partly to seasonal conditions. There is, however, slightly increased interest among consumers. Quotations are unchanged at 1.80c. to 1.85c., Pittsburgh.

Bars.—Steel bars are in more active demand. The inquiries do not involve large lots, but represent a fair total. More selling also has taken place the past week than the week previous. The price of 2c., Pittsburgh, is firm. The market for iron bars remains dull at a nominal level of 2c., Pittsburgh.

Billets.—Rerolling billets still are nominally quoted at \$36, Pittsburgh, but lack of inquiry and transactions leaves the market untested. It is reported that desirable business would be taken at \$1 a ton under this quoted level. Forging billets are easy at \$41, Pittsburgh.

Sheets.—The market for sheets remains dull with prices unchanged at the Pittsburgh equivalent of 2.60c. for No. 10 blue annealed, 3.50c. for black and 4.60c. for galvanized.

Ferroalloys.—The ferroalloy market remains quiet with a few small transactions at \$100 seaboard for foreign and the same price at furnace for domestic ferromanganese. Spiegeleisen continues to be quoted at \$31 to \$32, furnace.

Warehouse Business.—Jobbers report warehouse business quiet, due partly to the pending Presidential election. Hoops have declined 20c. per 100 lb.

Imports.—Among the imports at the port of Philadelphia in the week ended Nov. 1 were 300 tons of ferromanganese from England, 1932 tons of pig iron from India, 6190 tons of iron ore from Spain, 1522 tons of manganese ore from British West Africa, 2000 tons of manganese ore from India and 22 tons of scrap from England.

Old Material.—The market for scrap has become somewhat firmer. It is particularly noticeable that dealers are finding it more difficult to buy some grades at previous prices and they in turn are holding out for higher levels on their material when quotations are asked by consumers. Heavy melting steel has moved up 50c. a ton and now is quoted at \$17 to \$17.50. Machine shop turnings for both steel works and rolling mill use have strengthened, as have also several other grades. Dealers look for further improvement in the

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel.....	\$17.00 to \$17.50
Scrap rails	16.50 to 17.00
Steel rails for rolling.....	18.50
No. 1 low phos. heavy 0.04 and	
under	21.00 to 21.50
Couplers and knuckles.....	20.00 to 20.50
Rolled steel wheels.....	20.00 to 20.50
Cast-iron car wheels.....	17.50 to 18.00
No. 1 railroad wrought.....	18.00 to 18.50
No. 1 yard wrought.....	16.50 to 17.00
No. 1 forge fire.....	14.00 to 14.50
Bundled sheets (for steel works)	14.00
Mixed borings and turnings (for	
blast furnace use).....	12.50 to 13.50
Machine shop turnings (for steel	
works use)	14.00
Machine shop turnings (for roll-	
ing mill use).....	14.50 to 15.00
Heavy axle turnings (or equiv-	
alent)	15.00 to 16.00
Cast borings (for steel works and	
rolling mills)	14.00
Cast borings (for chemical plants)	
No. 1 cast.....	16.50 to 17.00
Heavy breakable cast (for steel	
plants)	17.50 to 18.00
Railroad grate bars.....	16.00 to 16.50
Stove plate (for steel plant use)	
Wrought iron and soft steel pipes	
and tubes (new specifications)	14.50 to 15.00
Shafting	24.00 to 25.00
Steel axles	24.00 to 25.00

San Francisco

Volume of Business Disappointing—Slight Improvement in Pig Iron

SAN FRANCISCO, Oct. 28.—Business in steel and iron maintains a sound undertone of steadiness, although the volume of trade movement is scarcely up to expectations based upon the outlook of a month ago. A careful study of the field shows that the requirements for this part of the State are normal and that the slowing down process applies to several sections outside of what may be termed the Bay Region. The export trade, too, has declined, but those most closely identified with this class of business say a falling off in orders at this time of the year is not unusual. The plain fact is that business generally in this State and on the Pacific Coast is less active than early in the year, but the steel and iron industries are in as satisfactory condition as any other branches of trade. All are affected alike and there is little reason to expect much improvement during the winter months. Building permits in this city and Los Angeles are less than at this time last year, but classified statistics show that the large structures wherein steel is largely used are sufficient to justify the belief that the demand for shapes and reinforcement materials will not suffer any decline, at least for some months. This character of work necessarily carries with it a demand for several important lines of finished wares. So the period of quiet has some elements of encouragement.

Pig Iron.—There is a moderate inquiry in progress and several dealers report sales as slightly better than a month ago. Both steel companies and foundries, however, are buying almost entirely in small lots and as they are credited with liberal supplies it is very doubtful whether small concessions in asking figures would induce the booking of larger orders. Importers are not complaining of any undue accumulations and the current prices show no important variations. The best grades of French and Belgian iron are selling at about the same figures as two weeks ago, although possibly the range is a trifle wider, say from \$26 to \$27.50 per ton. A moderate tonnage is on the way. The imports of Scotch and English iron were less during October than for the preceding month, although the quantities placed with consumers were nearly the same for both months. Prices are held fairly steady at from \$28.50 to \$29, with an occasional sale at \$29.50. Several of the largest consumers have some accumulation and they have purchased very sparingly during the last few weeks.

Coke.—Since the middle of the month, the receipts of coke have been a little over 3380 tons, a larger quantity than usual to come to hand within a short period. It is gradually being absorbed, however, and two cargoes expected to arrive during the last half of November will find the market well cleaned up. Prices are a shade easier and the present quotation is from \$16.50 to \$17.50 per ton. One of the railroad companies is in the market for about 600 tons and it will be placed within a few days, probably at a slight concession under the minimum figure named. Several hundred tons of coke from the Utah fields are reported as having arrived recently and tests have been very satisfactory in results.

Finished Steel and Iron.—Merchant bars are rather quiet for the present and prices remain the same as two weeks ago. Two fairly good orders from southern Oregon came to this city during the month and several inquiries from Nevada give promise of some business in that quarter. The demand for structural shapes continues steady and sales have been liberal. Orders for over 3680 tons have been booked within the last ten days and bids are asked on nearly as much more. There has been no change in prices, although the steady inquiry has served to maintain a good strong undertone. Sheets are in moderate demand. Sales of wire have been more than liberal for the last few weeks at sustained prices. The demand for nails, nuts, rivets and bolts continues steady, a feature of the week being a

large shipment of nails to Idaho, business from that distance being unusual to this city.

Old Material.—Business is of small proportions and while prices are not notably lower, there is a measure of easiness prevailing which makes the immediate future very uncertain. Supplies are extensive, as is evidenced by some 8000 tons held by different holders in this city and Oakland, besides nearly half as much more in storage within 100 miles of the Bay district. The price here for heavy melting steel is \$11 per ton, but it can scarcely be called steady. In Los Angeles there are also large available supplies with the price easy at \$10 per ton, and foundries buying very sparingly.

Canadian Scrap Market

TORONTO, ONT., Nov. 3.—Owing to the fact that the majority of the larger consumers have covered for last quarter requirements, future buying of iron and steel scrap has practically disappeared. Melters who have not taken advantage of the opportunity to place contracts are furnishing a fairly good demand for scrap for spot delivery and this business together with orders coming in against contract has resulted in a steady movement of old material between dealers and consumers. It is generally understood that foundries are not carrying excessive stocks at present but many are content to take in supplies on a hand-to-mouth basis and on this account local dealers are of the opinion that the spot demand will continue at present levels for some time to come. Foundry activities have not shown as much improvement as was expected, although in some quarters the daily melt is said to be increasing with average operations between 50 to 60 per cent capacity.

Little or no change is reported in mill activities during the past month. The Steel Co. of Canada, Ltd., Hamilton, Ont., is running about 65 per cent capacity, while only a few departments of the plants at Sault Ste. Marie, Ont., and Sydney, N. S., are in operation. From the Hamilton district a steady demand for heavy melting steel and turnings is reported and with dealers offering \$11 and \$9 per gross ton respectively for these commodities the supply is by no means limited. In the Montreal market, business has not shown as much strength as that of the Toronto district and sales are less numerous. The chief reason for this, however, is that the consumption of scrap in the former district is but little more than half of that used in Toronto. Prices are holding firm with dealers' buying prices as follows:

	Gross Tons	Toronto	Montreal
Steel turnings	\$9.00	\$8.00	
Machine shop turnings	9.00	7.00	
Wrought pipe	6.00	7.00	
No. 1 wrought scrap	12.00	12.00	
Heavy melting steel	11.00	10.50	
Steel axles	16.00	19.00	
Axles, wrought iron	19.00	20.00	
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	Net Tons		
Standard car wheels	16.00	17.00	
Malleable scrap	14.00	15.00	
Stove plate	14.00	13.00	
No. 1 machinery cast	18.00	18.00	

Detroit Scrap Market Quiet

DETROIT, Nov. 3.—There has been no change in prices in the past week on old material in this district. Dealers are marking time until after election and tonnage moving at present is on old orders. Considerable optimism is being expressed as to the future. Some pig iron inquiry is developing.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel	\$14.50 to \$15.00
Shoveling steel	14.50 to 15.00
Borings	11.25 to 11.75
Short turnings	11.25 to 11.75
Long turnings	10.25 to 10.75
No. 1 machinery cast	15.00 to 16.00
Automobile cast	17.00 to 18.00
Hydraulic compressed	12.50 to 13.00
Stove plate	13.50 to 14.50
No. 1 busheling	11.25 to 11.75
Sheet clippings	8.75 to 9.25
Flashings	11.25 to 11.75

European Markets Show Some Reaction

English Feeling Is Improving—Continent Shows Little Business but Expects Higher Prices—
Rail Mills Active

(By Cable)

LONDON, ENGLAND, Nov. 3.

In general, the tone of the iron and steel market is improving, on the election result. Some makers are hopeful of Government assistance. Meantime there is an increased demand for foundry pig iron and inquiries have been received up to September of next year. Hematite is firmer on increased sales but large stocks still await disposal.

Foreign ore is quiet. Bilbao Rubio is held at 21s. 3d. (\$4.82) ex-ship Tees.

Finished steel is better for the home trade, especially for the shipbuilding and engineering industries, but export markets still are bad, generally.

South Africa has awarded a contract for 50 all-steel railroad cars to the Leeds Forge Co., Ltd. The Metropolitan-Vickers Electrical Co., Ltd., Manchester, has secured a £430,000 contract for electrification of the New South Wales Railroad. At the annual meeting of the shareholders of Bolekow, Vaughan & Co., Ltd., Middlesbrough, it was stated that the directors are considering the possibility of consolidating their interests with those of another company.

Sheets and Tin Plate

Tin plate inquiry is improved though business still is only moderate. Some makers are anxious for specifications; others are well sold. Prices are firm on schedule basis.

Galvanized sheets are weak on poor demand; 24-gage corrugated bundles are being sold at £17 7s. 6d. (\$3.52c. per lb.) f.o.b.

Black sheets are dull. Far Eastern demand is hampered by unfavorable exchange rates. Merchants are offering low prices but makers' quotations are un-

changed. Japan 6x3, 13's, 107 lb. are held at £19 (3.85c. per lb.) f.o.b.

On the Continent of Europe

Continental advices confirm the fact that there is no truth in the rumor of the international steel combine, but reports now are current that French Lorraine and German Ruhr interests are arranging a mutual agreement for the exchange of Lorraine iron ore for Westphalian coke. This is all on the proviso of a successful issue to the negotiations for a Franco-German commercial treaty.

Continental market position still is obscure. Little business is passing here, but the tendency is upward. A general advance all around is anticipated. Sheet bars are being sold at £5 4s. (\$23.61) f.o.b.; joists (beams) at £5 10s. (1.12c. per lb.).

Belgian Luxemburg mills are being awarded 75,000 tons of rails for the Belgian State Railroad and the Société Anonyme d'Ougrée-Marihaye has secured an order from Sweden for 8000 tons of rails.

GERMAN CONDITIONS IMPROVING

Heavy Rail Orders Keep Mills Busy—Steel Syndicate May Be Revived

(By Radiogram)

BERLIN, GERMANY, Nov. 3.—The market is improving slowly, particularly in rails, for which the mills have orders for three months ahead. Krupp has received a new contract for 8500 tons of rails for the Swedish East Coast Railroad. Sales of sheets are

British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.54 per £1, as follows:

			\$5.68
Durham coke, del'd.	£1 5s.		
Bilbao Rubio ore†	1 4	5.45	—
Cleveland No. 1 fdy.	4 5	19.30	
Cleveland No. 3 fdy.	4 0	18.16	
Cleveland No. 4 fdy.	3 19	17.93	
Cleveland No. 4 forge	3 18	17.71	
Cleveland basic	4 0	18.16	
East Coast mixed	4 7½	19.86	
East Coast hematite	4 19 to £5 0m.	22.47 to \$22.70	
(a) Ferromanganese	13 10 and 18 0*	61.29 and 59.02	
Rails, 60 lb. and up.	9 10 to 9 15	43.13 to 44.27	
Billets	7 10 to 8 5	34.05 to 37.46	
Sheet and tin plate bars, Welsh	8 12½	39.16	
Tin plates, base box	1 3½	5.32	
		C. per Lb.	
Ship plates	9 0 to 9 10	1.82 to 1.93	
Boiler plates	13 0 to 13 10	2.63 to 2.74	
Tees	9 2½ to 9 12½	1.85 to 1.95	
Channels	8 7½ to 8 17½	1.70 to 1.80	
Beams	8 2½ to 8 12½	1.65 to 1.75	
Round bars, % to 3 in.	9 7½ to 9 17½	1.90 to 2.00	
Galv. sheets, 24 gage	17 7½	3.52	
Black sheets, 24 gage	12 10	2.53	
Black sheets, Japanese specifications	15 5	3.09	
Steel hoops	10 15 and 12 10*	2.18 and 2.53*	
Cold rolled steel strip, 20 gage	16 0	3.24	

*Export price.

†Ex-ship, Tees, nominal.

(a) Nominal.

Continental Prices, All F. O. B. Channel Ports (Nominal)

Foundry pig iron:			
Belgium	£3 10m.	15.89	\$15.89
France	3 10	15.89	15.89
Luxemburg	3 10	15.89	15.89
Basic pig iron:			
Belgium	3 8½ to £3 9m.	15.55 to 15.67	\$15.67
France	3 8½ to 3 9	15.55 to 15.67	15.67
Luxemburg	3 8½ to 3 9	15.55 to 15.67	15.67
Billets:			
Belgium	5 0	22.70	
France	5 0	22.70	
Merchant bars:		C. per Lb.	
Belgium	5 12½	1.14	
Luxemburg	5 12½	1.14	
France	5 12½	1.14	
Joists (beams):			
Belgium	5 10 to 5 12½	1.11 to 1.14	
Luxemburg	5 10 to 5 12½	1.11 to 1.14	
France	5 10 to 5 12½	1.11 to 1.14	
Angles:			
Belgium	5 0 to 5 5	1.62 to 1.67	
¼-in. plates:			
Belgium	6 17½	1.39	
Germany	6 17½	1.39	
½-in. ship plates:			
Luxemburg	6 17½	1.39	
Belgium	6 17½	1.39	

increasing. Solingen fine steel interests report greater activity. Machinery exports are increasing.

Prices of Finished Steel

Steel bars are held at 112 (gold) marks per metric ton (1.21c. per lb.) and thin sheets at 175 marks (1.89c.).

At the steel producers' meeting in Düsseldorf a protective import duty on heavy iron and steel was de-

manded. Negotiations for a revival of the Stahlbund (Steel Syndicate), with the aim of limiting production all around, are expected to succeed.

The Stinnes group has acquired control over the Baroper Walzwerke, A. G. (Baroper Rolling Mills Corporation, at Barop, Westphalia). [The plant has three 25-ton basic open-hearth furnaces and manufactures steel sheets.]

MORE ACTIVE STACKS

Net Gain of Three Blast Furnaces in October in Pittsburgh District

PITTSBURGH, Nov. 3.—There was a net gain of three blast furnaces in the active list of Pittsburgh and nearby district during October. The Carnegie Steel Co. added two furnaces to the producing list and the Bethlehem Steel Co., one at Johnstown, Pa. Furnaces of the Clinton Iron & Steel Co., Pittsburgh, the only merchant stack in Pittsburgh, and of the A. M. Byers Co., Girard, Ohio, resumed production after an idleness of several months. Against these gains, is the dropping of one furnace of the Jones & Laughlin Steel Corporation, of its Aliquippa group and the Jeannette furnace of the Youngstown Sheet & Tube Co., Youngstown. The furnace dropped by the Jones & Laughlin Steel Corporation has been making ferromanganese. There is now a total of 73 out of a total of 139 furnaces scattered between Johnstown and Erie, Pa., on the East and Dover, Ohio, and Wheeling, W. Va., in the West and South in production, but the production percentage is higher than is indicated by the numerical percentage, due to the fact that most of the furnaces in blast are of high rated capacity. Only one of the active furnaces has a rated capacity of less than 10,000 tons a month.

The record of the furnaces in an out of production as of Nov. 1, compares with that for Sept. 30, as follows:

Pittsburgh District						
STEEL WORKS FURNACES						
	Nov. 3—			Sept. 30		
	Total	In	Out	Total	In	Out
American Steel & Wire Co.						
Donora	2	1	1	1	1	1
Schoenberger	2	0	2	0	2	1
Carnegie Steel Co.						
Carrie	7	7	0	7	0	0
Clairton	3	2	1	2	1	1
Duquesne	6	4	2	3	3	3
Edgar Thomson	11	6	5	6	5	5
Edith	1	0	1	0	1	1
Isabella	3	0	3	0	3	3
Lucy	2	2	0	1	1	1
Neville	1	1	0	1	0	0
Jones & Laughlin Steel Corporation						
Aliquippa	5	4	1	5	0	0
Eliza	6	4	2	4	2	2
Soho	1	0	1	0	1	1
National Tube Co.	4	3	1	3	1	1
Pittsburgh Crucible Steel Co.	2	1	1	1	1	1
Pittsburgh Steel Co.	2	1	1	1	1	1
MERCHANT FURNACES						
Clinton Iron & Steel Co.	1	1	0	0	0	1
Total	59	37	22	35	24	1

Mahoning and Shenango Valley Districts

Mahoning and Shenango Valley Districts						
STEEL WORKS FURNACES						
	Nov. 3—			Sept. 30		
	Total	In	Out	Total	In	Out
Carnegie Steel Co.						
Farrell	3	1	2	1	2	2
New Castle	4	2	2	2	2	2
Niles	1	0	1	0	1	1
Ohio	6	5	1	5	1	1
Sharon	1	0	1	0	1	1
Republic Iron & Steel Co.	7	2	5	2	5	1
Sharon Steel Hoop Co.	1	1	0	1	0	0
Trumbull Cliffe Furnace Co.	1	1	0	1	0	0
Youngstown Sheet & Tube Co.	9	4	5	5	4	1
MERCHANT FURNACES						
A. M. Byers Co.	1	1	0	0	1	1
Hanna Furnace Co.						
West Middlesex	1	0	1	0	1	1
Leetonia, Ohio	1	0	1	0	1	0
Dover, Ohio	1	1	0	1	0	0
Reliance Coke & Furnace Co.						
West Middlesex	1	0	1	0	1	1
Sharpsville, Pa.	1	1	0	1	0	0
McKeeffey Iron Co.	1	0	1	0	1	1
Sharpsville Furnace Co.	1	1	0	1	0	0
Shenango Furnace Co.	2	1	1	1	1	1
Struthers Furnace Co.	1	0	1	0	1	1
Stewart Furnace Co.	1	0	1	0	1	1
Valley Mold & Iron Corporation	1	0	1	0	1	1
Total	46	21	25	21	24	1

Western Pennsylvania STEEL WORKS FURNACES

	Nov. 3—			Sept. 30		
	Total	In	Out	In	Out	
Bethlehem Steel Co., Johnstown, Pa.	11	6	5	5	5	6
MERCHANT FURNACES						
Adrian Furnace Co.	1	0	1	0	1	1
American Manganese Mfg. Co.	2	0	2	0	2	2
Kittanning Iron & Steel Mfg. Co.	1	0	1	0	1	1
McKinney Steel Co.						
Scottsdale, Pa.	1	1	0	1	0	0
Josephine, Pa.	2	0	2	0	2	2
Perry Furnace Co.	1	1	0	1	0	0
Punxsutawney Furnace Co.	1	0	1	0	1	1
Total	20	8	12	7	7	13

Wheeling District STEEL WORKS FURNACES

	Nov. 3—			Sept. 30		
	Total	In	Out	In	Out	
Carnegie Steel Co.						
Bellaire, Ohio	2	1	1	1	1	1
Mingo, Ohio	4	1	3	1	3	3
Steubenville, Ohio	1	0	1	0	1	1
National Tube Co.	2	1	1	1	1	1
Wheeling Steel Corporation	4	3	1	3	1	1
Weirton Steel Co.	1	1	0	1	0	0
Total	14	7	7	7	7	7
Grand total	139	73	65	70	68	

MidwestForgings Co. Recapitalized—G. H. Jones Is New President

Owing to the death of Harold C. Jones, president Midwest Forgings Co., Chicago, with works at Chicago Heights, Ill., G. H. Jones, father of the deceased and formerly prominently connected with the Inland Steel Co., has decided to take over the property and recapitalize it. Associated with him in the undertaking is Jay L. Hench, who formerly represented the Lackawanna Steel Co. at Chicago. Strengthened both in its finances and its manufacturing position, the Midwest plant is now running at capacity day and night. Its output embraces spike and spring harrow teeth, cultivator springs, hay rake teeth, potato digger links, special light forgings and other iron and steel products. R. C. Rowan continues as general manager, while G. H. Jones has been named president and Mr. Hench, vice-president. Executive offices are at 1212 First National Bank Building, Chicago.

Use of Rail Steel Permitted

BUFFALO, Nov. 3.—Building ordinances of Buffalo will be amended to permit the use of bent rail steel for reinforcement purposes. The change was opposed by representatives of several steel companies, who asserted that rail steel loses strength when reheated and bent and is not as safe as new steel. Representatives of the Buffalo Steel Co., which makes rail steel bars, contended the opposition was the result of a desire to restrict competition and offered to bend the rail steel cold. In the end, the council decided to permit the use of rail steel provided it is in accord with standard building requirements.

Doehler Brooklyn Plant Dismantled

BUFFALO, Nov. 3.—According to an announcement made in Batavia, N. Y., by H. H. Doehler of Brooklyn, president Doehler Die Casting Co., the company's Brooklyn plant will be dismantled during the winter months, and the machinery distributed to the Batavia, Pottstown, Pa., and Toledo, Ohio plants. The new policy is instituted to effect economies, it was stated. It was learned at the Brooklyn works that the change has already begun and that it will be continued gradually in order that demands from customers shall be met without interference.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

Oct.	Lake	Straits		Lead		Zinc	
		Electro-	Spot	New	New	St.	St.
		lytic*		York	York	Louis	Louis
29.....	13.50	13.25	52.62½	9.00	8.87½	6.85	6.50
30.....	13.50	13.25	52.87½	8.80	8.87½	6.85	6.50
31.....	13.50	13.37½	53.25	8.80	8.87½	6.85	6.50
Nov.							
1.....	13.50	13.37½	....	8.85	8.87½	6.87½	6.52½
3.....	13.50	13.37½	53.50	8.90	8.87½	6.90	6.55

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Nov. 3.

Previous to the election the markets are all very quiet but strong. Copper is a little higher with buying good. Tin continues to advance in a speculative market. Lead is a little easier with prices slightly lower. Demand for zinc is good and prices are firm.

Copper.—Both foreign and domestic buying of copper continues steady and prices are tending upward. Most sellers report satisfactory inquiries, many of which have resulted in substantial business. Electrolytic copper today is quoted at a minimum of 13.62½c., delivered, with some sellers asking 13.75c. Despite the usual quietness preceding election day, interest of consumers is reported fairly active. Lake copper is quoted at 13.50c. to 13.62½c., delivered.

Copper Averages.—The average price of Lake copper for the month of October, based on daily quotations in THE IRON AGE, was 13.25c. The average price of electrolytic copper was 12.96c., refinery, or 13.21c., delivered.

Tin.—The market during the week has been spotty in its activities, sales on some days being fairly good. On Oct. 28 sales of 200 to 300 tons were made, the bulk going to consumers. On the two days following only light sales are reported, totaling possibly 200 tons. By the next day, or Oct. 31, a better tone developed and early in the day sales were made of about 300 tons at 53c. to 53.12½c. Later in the day spot metal sold at 53.37½c. and futures at 53.25c. After a lull in the market dealers became active late in the day and absorbed all unsold parcels, bringing the day's total transactions to about 500 tons. The activity of that day was not continued on Saturday, nor was the sharp rise, which was naturally expected, in evidence yesterday or today. In only a moderately active market today, spot Straits tin was quoted at 53.50c., New York. In London prices today were about £6 per ton higher than a week ago, with spot standard quoted at £259 5s., future standard at £261 and spot Straits at £261. The Singapore market yesterday was quoted at £264 15s., with heavy sales. It is evident that the tin, tied up in that locality, is being released. Deliveries into consumption during October were 5090 tons, with 2110 tons in stock and 300 tons landing on Oct. 31. The tin afloat is reported as 6150 tons.

Lead.—The contract price of the leading interest continues unchanged at 8.65c., New York. The outside market is still considerably higher but easier, due to a large independent Western producer taking orders below prevailing prices. Quotations in the outside market depend almost entirely on the relations between sellers and buyers, with business being done at a range of 8.75c. to 8.95c., St. Louis, and 8.90c. to 9c., New York.

Zinc.—Foreign demand continues the main strength of prime Western zinc, although domestic demand is also fairly good. Prices are as strong or as strong as a week ago, with prime Western quoted at 6.52½c. to 6.57½c., St. Louis, or 6.87½c. to 6.92½c., New York.

Nickel.—Quotations for shot and ingot nickel are unchanged at 28c. to 30c. per lb., with electrolytic nickel quoted at 33c.

Antimony.—The market is easier and Chinese metal in wholesale lots is quoted at 12c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c., duty paid, delivered.

Old Metals.—The market is strong and active. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible.....	13.00
Copper, heavy and wire.....	12.00
Copper, light and bottoms.....	10.75
Heavy machine composition.....	10.00
Brass, heavy.....	8.75
Brass, light.....	7.00
No. 1 red brass or composition turnings.....	8.75
No. 1 yellow rod brass turnings.....	8.35
Lead, heavy.....	7.75
Lead, tea.....	6.75
Zinc.....	4.25
Cast aluminum.....	17.50
Sheet aluminum.....	17.50

Chicago

Nov. 3.—Considerable copper has been bought at advancing quotations. Tin has also gone up, while the prices of the other metals have held firmly, notwithstanding a slackening of the market during the past few days. Old metal prices remain unchanged. We quote in carload lots: Lake copper, 14c.; tin, 54.25c.; lead, 9.15c.; spelter, 6.55c.; antimony, 13.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.25c.; red brass, 8.25c.; yellow brass, 7c.; lead pipe, 7.75c.; zinc, 4c.; pewter, No. 1, 25c.; tin foil, 31c.; block tin, 42c.; all buying prices for less than carload lots.

Will Consider Reduction of Varieties of Steel Lockers

WASHINGTON, Nov. 3.—Following an extended study of the sizes and varieties of steel lockers, the Division of Simplified Practice has sent out invitations to manufacturers, distributors and users of this product to attend a conference on Nov. 19, in the Department of Commerce to consider the elimination of excess varieties. This conference is a sequel to a meeting of manufacturers held in February, 1923, when it was suggested that steel lockers, now being made in 50 or more sizes and styles, could be simplified to a much smaller number without interfering with the normal purposes for which they are made. The survey which followed indicated that the greater portion of the demand is covered by 14 items. The tentative recommendations for the standard sizes to be retained provide for three widths, four depths, and four heights, and the adoption of these sizes as the recognized varieties will rest on the action of the general conference. The invitations include more than 200 associations representing the users as well as 100 or more individual firms.

Tentative sizes proposed as the result of the survey are as follows:

Width in Inches	Depth in Inches	Height in Inches
12	12	36
12	15	36
15	15	36
12	18	42
12	15	42
12	12	60
12	15	60
15	15	60
12	12	72
12	15	72
15	15	72
15	18	72
18	18	72
18	24	72

The practicability of including compartment and multiple tier steel lockers in this recommendation will also be acted upon by the conference, it was announced.

Production of anthracite is reported by the United States Geological Survey at 1,927,000 tons for the week ended Oct. 25, compared with 1,750,000 tons for the previous week and 1,737,000 tons for the week before that. These figures are well below the corresponding production of last year. For 1924 up to Oct. 25, production is given as 874,690,000 tons, compared with 77,493,000 tons for the corresponding period of last year.

Prices of Finished Iron and Steel Products

(Carload Lots)

Tank Plates

F.o.b. Pittsburgh mills, base, per lb.....	1.80c. to 1.90c.
F.o.b. Chicago, base, per lb.....	2.10c.

Structural Shapes

F.o.b. Pittsburgh mills, base, per lb.....	2.00c.
F.o.b. Chicago, base, per lb.....	2.10c.

Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb.....	2.00c.
Soft steel bars f.o.b. Chicago, base, per lb.....	2.00c. to 2.10c.
Reinforcing steel bars f.o.b. P'gh mills, base, per lb.....	2.00c.
Rail steel bars f.o.b. Chicago district mills, base, per lb.....	2.00c.
Common iron bars delivered New York, base, per lb.....	2.34c.
Common iron bars f.o.b. Chicago, base, per lb.....	2.10c.
Refined iron bars f.o.b. P'gh mills, base, per lb.....	2.90c. to 3.00c.
Common iron bars delivered Philadelphia, base, per lb.....	2.32c.

Hot-Rolled Flats

(Pittsburgh)

Hoops, base, per lb.....	2.50c. to 2.60c.
Bands, base, per lb.....	2.40c. to 2.50c.
Strips, base, per lb.....	2.25c. to 2.40c.

Cold-Finished Steel

Bars and shafting, f.o.b. P'gh mills, base, per lb.....	2.70c.
Bars and shafting f.o.b. Chicago mills, base, per lb.....	2.70c.
Screw stock, Worcester mills, base, per lb.....	2.90c.
Shafting, ground, f.o.b. mill, base, per lb.....	3.10c.
Screw stock, base, per lb., Cleveland.....	2.75c.
Strips, f.o.b. P'gh mills, base, per lb.....	4.00c.
Strips, f.o.b. Cleveland mills, base, per lb.....	4.00c.
Strips, f.o.b. Chicago mills, base, per lb.....	4.30c.
Strips, f.o.b. Worcester mills, base, per lb.....	4.15c.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)	
Nails, base, per kg.....	\$2.75
Bright plain wire, base, No. 9 gage, per 100 lb.....	2.50
Annealed fence wire, base, per 100 lb.....	2.65
Galvanized wire No. 9, base, per 100 lb.....	3.10
Galvanized barbed, base, per 100 lb.....	3.45
Galvanized staples, base, per kg.....	3.45
Painted barbed wire, base, per 100 lb.....	3.20
Polished staples, base, per kg.....	3.20
Cement coated nails, base, per count kg.....	\$2.10 to 2.15
Woven wire fence, base, per net ton to retailers.....	\$65.00

Chicago district mill prices are \$2 per ton above the foregoing and Chicago delivered prices are \$3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mills \$3 a ton higher on products of that plant, and Duluth, Minn., mills \$4 a ton higher.

Sheets

Blue Annealed

(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh dist. mills.....	2.60c. to 2.70c.
*Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills.....	2.80c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mills.....	3.40c. to 3.50c.
*No. 28 (base) per lb., f.o.b. Chicago dist. mills.....	3.60c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mills.....	4.50c. to 4.60c.
*No. 28 (base) per lb., f.o.b. Chicago dist. mills.....	4.70c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mills.....	3.40c. to 3.50c.
*No. 28 (base) per lb., f.o.b. Chicago dist. mills.....	3.60c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. mill.....	4.60c.
*Add 5c. per 100 lb. for delivery in Chicago.	

Tin Plate

Standard cokes, per base box f.o.b. Pittsburgh district

Mills \$5.50

Standard cokes, per base box f.o.b. Chicago district mills 5.60

Standard cokes, per base box f.o.b. Elwood, Ind..... 5.60

Terne Plate

(F.o.b. Pittsburgh, district mills)

(Per Package, 20 x 28 in.)

8-lb coating, 100 lb. base	20-lb. coating I. C.... \$14.90
8-lb. coating I. C.... 11.30	25-lb. coating I. C.... 16.20
12-lb. coating I. C.... 12.70	30-lb. coating I. C.... 17.35
15-lb. coating I. C.... 13.95	35-lb. coating I. C.... 18.35
	40-lb. coating I. C.... 19.35

Rivets

Large, f.o.b. P'gh and Cleveland mill, base, per 100 lb..	\$2.60
Large, f.o.b. Chicago mills, base, per 100 lb.....	2.75
Small, f.o.b. P'gh and Cleveland mills	
70, 10 and 5 per cent off list	

Small, f.o.b. Chicago mills..... 70 and 10 off list

Rails and Track Equipment

(F.o.b. mill)

Rails, standard, per gross ton.....	\$43.00
Rails, light, billet, base, per lb.....	1.80c. to 1.90c.
Rails, light rail steel, base, per lb.....	1.65c. to 1.75c.
Spikes, $\frac{1}{2}$ in. and larger, base, per 100 lb.....	\$2.70 to \$3.00
Spikes, $\frac{1}{2}$ in. and smaller, base, per 100 lb.....	3.00
Spikes, boat and barge, base, per 100 lb.....	3.00
Track bolts, all sizes, base, per 100 lb.....	3.75 to 4.00
Track bolts, heat treated, base, per 100 lb.....	4.25 to 4.50
Tie plates, per 100 lb.....	2.40 to 2.50
Angle bars, base, per 100 lb.....	2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Inches	Steel Black	Galv.	Iron Black	Galv.
$\frac{1}{4}$	45	19 $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{4}$	+11
$\frac{1}{2}$ to $\frac{3}{4}$	51	25 $\frac{1}{2}$	$\frac{1}{2}$	22
$\frac{3}{4}$	56	42 $\frac{1}{2}$	$\frac{1}{2}$	28
$\frac{5}{8}$	60	48 $\frac{1}{2}$	1 to $\frac{1}{2}$	30
1 to 3	62	50 $\frac{1}{2}$		13

Lap Weld

2	55	43 $\frac{1}{2}$	2	23
$\frac{3}{4}$ to 6	59	47 $\frac{1}{2}$	$\frac{1}{2}$ to 6	26
7 and 8	56	43 $\frac{1}{2}$	3 to 6	28
9 and 10	54	41 $\frac{1}{2}$	7 to 12	26
11 and 12	53	40 $\frac{1}{2}$		11

2	41	24 $\frac{1}{2}$	2 to 3	61
$\frac{1}{2}$ to $\frac{3}{4}$	47	30 $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{4}$	+11
$\frac{3}{4}$	53	42 $\frac{1}{2}$	$\frac{1}{2}$	21
$\frac{5}{8}$	58	47 $\frac{1}{2}$	$\frac{1}{2}$	28
1 to $\frac{1}{2}$	60	49 $\frac{1}{2}$	1 to $\frac{1}{2}$	30

2	53	42	2	23
$\frac{3}{4}$ to 4	57	46 $\frac{1}{2}$	$\frac{1}{2}$ to 4	29
$\frac{1}{2}$ to 6	56	45 $\frac{1}{2}$	4 $\frac{1}{2}$ to 6	28
7 to 8	52	39 $\frac{1}{2}$	7 to 8	21
9 and 10	45	32 $\frac{1}{2}$	9 to 12	16
11 and 12	44	31 $\frac{1}{2}$		2

To the large jobbing trade the above discounts are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by $\frac{1}{2}$ points, with supplementary discount of 5 per cent.

Note—The above discounts on steel pipe also apply at Lorain and Youngstown, Ohio, and Wheeling, W. Va. Chicago district mills have a base 2 points less. Chicago delivered base $\frac{1}{2}$ points less.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel	Charcoal Iron
2 to 2 $\frac{1}{2}$ in.....	27
2 $\frac{1}{2}$ to 2 $\frac{3}{4}$ in.....	37
3 in.....	40
3 $\frac{1}{4}$ to 3 $\frac{3}{4}$ in.....	42 $\frac{1}{2}$
4 to 13 in.....	46

Beyond the above discounts, 5 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.....	55-58	3 and 3 $\frac{1}{4}$ in.....	36-39
1 $\frac{1}{4}$ and 1 $\frac{1}{2}$ in.....	47-50	3 $\frac{1}{2}$ and 3 $\frac{3}{4}$ in.....	37-40
1 $\frac{1}{4}$ in.....	31-34	4 in.....	41-44
2 and 2 $\frac{1}{2}$ in.....	22-25	4 $\frac{1}{2}$ in. and 5 in.....	33-37
2 and 2 $\frac{1}{2}$ in.....	32-35		

Hot Rolled

3 and 3 $\frac{1}{4}$ in.....	38-41	4-in.	43-46
3 $\frac{1}{2}$ in. and 3 $\frac{3}{4}$ in....	39-42		

Less carloads, 4 points less. Add \$8 per net ton for more than four g

Prices of Raw Materials, Semi-Finished and Finished Products

Oregon

Lake Superior Ores. Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	.....	\$5.65
Old range non-Bessemer, 51½ per cent Iron	.....	4.90
Mesabi Bessemer, 55 per cent iron	.....	5.40
Mesabi non-Bessemer, 51½ per cent iron	.....	4.75
<i>Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore</i>		
Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	.....	9.00c. to 9.50c.
Iron ore, Swedish, average 66 per cent iron	.....	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal	.....	42c.
Manganese ore, ordinary, 48 per cent manganese from the Caucasus	.....	40c.
Manganese ore, Brazilian or Indian, nominal	.....	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates	.....	\$8.00 to \$8.50
Chrome ore, basic, 48 per cent Cr ₂ O ₃ , crude, per ton, c.i.f., Atlantic seaboard	.....	18.50 to 24.00
Molybdenum ore, 85 per cent concentrates, per lb. or MoS ₂ , New York	.....	80c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$90.00 to \$100.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid.....	92.50 to 100.00
Ferrosilicon, 50 per cent, delivered.....	70.00 to 75.00
Ferrosilicon, 75 per cent.....	140.00
Ferrotungsten, per lb. contained metal....	
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	87c. to 90c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.....	10.75c.
Ferrovanadium, per lb. contained vanadium	10.50c.
Ferrocabontitanium, 15 to 18 per cent, per net ton	\$3.50 to \$4.00
	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated.)

Spiegeleisen, domestic, 19 to 21 per cent.....	\$20.00 to \$33.00
Spiegeleisen, domestic, 16 to 19 per cent.....	29.00 to 32.00
Ferrosilicon, Bessemer, 10 per cent, \$39.50; 11 per cent, \$42;	
12 per cent, \$44.50; 14 to 16 per cent (electric furnace),	
\$46.00.	
Silvery iron, 5 per cent, \$27.00; 6 per cent, \$28.00; 7 per cent,	
\$29.00; 8 per cent, \$29.00 to \$30.00; 9 per cent, \$32.50;	
10 per cent, \$34.50; 11 per cent, \$37.00; 12 per cent,	
\$39.50.	

• Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines	\$17.50
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines	18.50
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per gross ton.....	19.75
Per 1000 f.o.b. works:	
Fire Clay:	
Pennsylvania	High Duty \$36.00 to \$40.00
Maryland	45.00 to 47.00 40.00 to 42.00
Ohio	40.00 to 43.00 37.00 to 39.00
Kentucky	42.00 to 43.00 37.00 to 39.00
Illinois	— 37.00 to 42.00
Missouri	42.00 to 45.00 35.00 to 40.00
Illinois	42.00 to 45.00 —
Ground fire clay, per net ton.....	6.00 to 7.00
Silica Brick:	
Pennsylvania	33.00
Chicago	43.00 to 44.00
Birmingham	50.00
Ground silica clay, per net ton.....	7.50 to 8.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00
Chrome Brick:	
Standard size, per net ton	45.00

Bolts and Nuts

(Chicago and Pittsburgh)

Machine bolts, small rolled threads	.60 and 20 per cent off list
Machine bolts, all sizes, cut threads	.60 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads,	.60 and 10 per cent off list
Carriage bolts, cut threads, all sizes	.60 per cent off list
Hot-pressed nuts, blank or tapped, square	.450c. off list
Hot-pressed nuts, blank or tapped, hexagons	.50c. off list
C.P.C. and t. square or hex. nuts, blank or tapped	.450c. off list
Eagle carriage bolts	.65, 10 and 10 per cent off list
Plow bolts	.50, 10 and 5 per cent off list
Semi-finished hex. nuts:	
1 in. and smaller, U. S. S.	.80, 10, 10 and 5 per cent off list
1 1/2 in. and larger, U. S. S.	.75, 10, 10 and 5 per cent off list
Small sizes, S. A. E.	.80, 10, 10, 10 and 5 per cent off list
S. A. E., 1 1/2 in. and larger	.80, 10 and 5 per cent off list
Stove bolts in packages	.80, 10 and 5 per cent off list
Stove bolts in bulk	.50, 10, 5 and 2 1/2 per cent off list
Tire bolts	.60 and 10 per cent off list
Bolt ends with hot pressed nuts	.60 and 10 per cent off list
Bolt ends with cold pressed nuts	.50 and 10 per cent off list
Washers	.600c. to 6.25c. off list
Lock washers	.60 per cent off list

Foreign prices are quoted f.o.b. Cleveland by Cleveland manufacturers for Cleveland delivery.

Semi-Finished Castellated and Slotted Nuts

(Chicago and Pittsburgh)

(To jobbers and consumers in large quantities)

	Per 1000 S. A. E. U. S. S.		Per 1000 S. A. E. U. S. S.
1/4-in.	\$4.25	4-in.	\$12.25
5/16-in.	4.90	5-in.	16.25
3/8-in.	5.90	6-in.	22.50
7/16-in.	7.50	7-in.	34.00
1/2-in.	9.75	1-in.	53.00
	10.00		55.00

Larger sizes—Prices on application.

Cap and Set Screws

(F.o.b. shipping point.)

Milled hex. cap screws.....	85 and 10 per cent off list
Milled standard set screws, case hardened.....	85 and 10 per cent off list
Milled headless set screws, cut thread.....	85 and 10 per cent off list
Upset hex. head cap screws, U. S. S. thread.....	85, 10, 10 and 5 per cent off list
Upset hex. head cap screws, S. A. E. thread.....	85, 10, 10 and 5 per cent off list
Milled studs.....	80 and 10 per cent off list
Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown,	per gross ton

**Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown,
per gross ton**

Rolling billets, 4-in. and over.	\$35.00 to \$36.00
Forging billets, ordinary carbons.	10.50 to 41.00
Sheet bars, Bessemer.	37.00 to 37.50
Sheet bars, open hearth.	37.00 to 37.50
Slabs	35.50 to 36.00
*Wire rods, common soft, base, No. 5 to $\frac{1}{2}$ -in.	45.00 to 46.00
Wire rods, common soft, coarser than $\frac{1}{2}$ -in.	\$2.50 over base
Wire rods, screw stock.	\$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40.	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.	7.50 per ton over base
Wire rods, carbon over 0.75.	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	1.90c to 2c.
Skelp, snared, per lb.	1.90c to 2c.
Skelp, universal, per lb.	1.90c to 2c.

***Chicago mill base is \$18.90.**

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E. Series Numbers	Bars 100lb.
21000 (1% Nickel, 10 to 20 per cent Carbon)	\$3.00 to \$3.25
23000 (3½% Nickel)	4.75
25000 (5% Nickel)	6.00 to 6.50
31000 (Nickel Chromium)	3.65 to 3.75
32000 (Nickel Chromium)	5.50 to 6.75
33000 (Nickel Chromium)	7.25 to 8.00
34000 (Nickel Chromium)	6.50 to 7.00
51000 (Chromium Steel)	2.50 to 3.75
52000 (Chromium Steel)	7.50 to 9.00
61000 (Chromium Vanadium bars)	4.50
61000 (Chromium Vanadium spring steel)	4.25 to 4.50
92500 (Silicon Manganese spring steel)	3.50 to 3.75
Carbon, Non-ductile (0.45 to 0.55 Carbon)	6.15

Carbon Vanadium (0.15 to 0.50 Carbon, 0.15- Vanadium)	4c.
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	4.25 to 4.50
Chromium Molybdenum bars (0.80-1.10 Chro- mium, 0.25-0.40 Molybdenum)	4.25 to 4.50
Chromium Molybdenum bars (0.50-0.70 Chro- mium, 0.15-0.25 Molybdenum)	3.75 to 4.25
Chromium Molybdenum spring steel (1-1.35 Chromium, 0.30-0.50 Molybdenum)	4.75 to 5.00

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

FABRICATED STEEL BUSINESS

Pre-Election Buying in Good Volume—One Award Totals 8500 Tons—Inquiries for Sizable Tonnages

Awards of structural steel in the past week, upward of 20,000 tons, were several thousand tons in excess of the previous week's orders. New business, although less than the new projects that appeared the week before, totaled more than 28,000 tons and included several projects calling for sizable lots. In the awards, several of which were of 1000 tons or more, was 8500 tons for a loft building at 1 Park Avenue, New York.

Bing & Bing, Inc., hotel building, Lexington Avenue and Twenty-first Street, New York, 1000 tons, to Lehigh Structural Steel Co.

Loft building at Thirty-fourth Street and Park Avenue, New York, 8500 tons, to Hay Foundry & Iron Works.

Tigo Realty Co., New York, apartment, 10 and 12 West Eighty-sixth Street, 450 tons, to Hay Foundry & Iron Works.

Building, 263-278 West Thirty-eighth Street, New York, 1500 tons, to A. E. Norton, Inc.

Knights of Columbus building, Fifty-first Street and Eighth Avenue, New York, 3000 tons, to A. E. Norton, Inc.

George A. Fuller Co., New York, 15 story apartment building, 164 East Seventy-second Street, 850 tons, to A. E. Norton, Inc.

Baltimore & Ohio Railroad, two bridges, 225 tons, to American Bridge Co.

J. S. Phipps, New York, apartment building, Fifty-seventh Street, 2100 tons to George A. Just Co.

Apartment building, Fifth Avenue, New York, 400 tons, to local fabricator.

St. Joseph Convent, Cleveland, 325 tons, to Moss Iron Works.

American Insurance Union Building, Columbus, Ohio, additional steel for cutting frames and foundations, 130 tons, to McClintic-Marshall Co.

Newton Steel Co., Newton Falls, Ohio, extensions, 300 tons, to McClintic-Marshall Co.

Keith Theater, Columbus, Ohio, 1200 tons, to McClintic-Marshall Co.

Texas State highway project 513, Cameron, Milam County, Tex., three 192-ft. through riveted truss spans, 324 tons, to Wisconsin Bridge & Iron Co.

Minnesota & Ontario Paper Co., Minneapolis, insulite building, International Falls, Minn., 284 tons, to Minneapolis Steel & Machinery Co.

L. S. Plaut & Co., Newark, department store, 3600 tons, awarded by Starrett Brothers, contractors, to Hedden Iron Construction Co.

International Harvester Co., Service Station, Long Island City, New York, 200 tons to Neinken-Mertz Construction Co., Brooklyn, N. Y.

United States Cast Iron Pipe & Foundry Co., Scottdale, Pa., washer and locker building, 100 tons, to Jones & Laughlin Steel Corporation.

Rock Island Lines, coach shop, Shawnee, Okla., 100 tons, to Eggers-Schillo Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Mead-Morrison Mfg. Co., Boston, 400 tons.

Memorial stadium, Youngstown, Ohio, 200 tons.

Hotel, Dallas, Tex., 500 tons.

East St. Louis, Mo., municipal stadium, 2500 tons.

Louisville & Nashville Railroad, 1200 tons, for bridge work.

American Laundry Machinery Co., plant at Rochester, 1100 tons, tentative bids asked.

Mississippi River Commission, 17 barges, 2100 tons, Dravo Contracting Co. low bidder.

Jewelers' Building, South Water Street and Wabash Avenue, Chicago, 7000 tons, plans issued.

Warehouse, Akron, Ohio, 1000 tons.

Illinois Central, buildings, Burnside shops, Chicago, 7000 tons.

Union Electric Co., power house, Cahokia River Station, Ill., near St. Louis, 2500 tons.

Standard Oil Co., plant addition, Whiting, Ind., 1500 tons.

Webster Mfg. Co., Chicago, coke and coal handling system, Erie, Pa., 500 tons, bids being taken.

Argyle Building, Kansas City, Mo., six-story addition, 250 tons.

Detroit Gas Co., Detroit, two buildings, 150 tons.

Grand Trunk Railway System, deck and through plate girder spans, 150 tons.

RAILROAD EQUIPMENT BUYING

Car Orders Numerous but Small—Interest in Underframes—Southern Pacific Buys Most Powerful Locomotive

Orders placed for cars in the past week were small and reported purchases only total 30 cars with current inquiries numerous but largely for one or two. Interest in steel underframes has been fairly active, orders for more than 4000 having been placed and 1200 being under inquiry. Recent purchases of locomotives have totaled 53, included in these being the noteworthy order by the Southern Pacific of the most powerful non-articulated type locomotive ever built.

The Western Fruit Growers Express is inquiring for 1200 steel underframes.

The Delaware, Lackawanna & Western is in the market for 30 steel express cars, 60 ft. long.

The Southern Railway is inquiring for 1000 sets of steel center sills for freight cars and is in the market for one three-cylinder locomotive.

The Pennsylvania Railroad is constructing 50 8-wheel switching engines of new design at its Altoona works.

The Wabash Railway Co. has purchased 50 Mikado type locomotives, five of the new 8-cylinder type, from the American Locomotive Co.

The Delaware, Lackawanna & Western Railroad has placed an order for two 3-cylinder mountain type locomotives with the American Locomotive Co.

The Southern Pacific System has ordered the most powerful, non-articulated type locomotive ever built from the American Locomotive Co. and is understood to be contemplating the purchase of 18 locomotives of the 2-10-2 type.

The Central Railroad of New Jersey has purchased 25 30-yd. extension side dump cars from the Magor Car Corporation.

The Great Northern has placed 3800 underframes for refrigerator cars with the Siems-Stembel Co.

The St. Louis-San Francisco has placed 400 underframes with the Tennessee Coal, Iron & Railroad Co.

The Interstate Iron & Steel Co., Chicago, has resumed dividend payments on preferred stock with a declaration of a 1 1/4 per cent quarterly distribution, payable Dec. 1 to stockholders of record Nov. 20. This is the first dividend paid by the company since the close of 1921. In its announcement the company stated that this year's earnings are fair and the floating debt has been materially reduced. Concurrently a suit has been filed in the Superior Court at Chicago by Benjamin B. Morris, a holder of preferred stock, asking for the payment of \$168,000, which, it is alleged, is due to preferred stockholders for dividends in 1922 and 1923. The appointment of a receiver is asked, as well as an injunction against the paying of alleged excess salaries to officers and directors.

The General Refractories Co. has moved its Pittsburgh district sales offices from Room 1243 Oliver Building to Room 2328 in the same building.

PERSONAL

Wallace A. Stuart has been transferred from the Cleveland to the Pittsburgh district sales office of the General Refractories Co. Before joining the General Refractories Co., Mr. Stuart was with the Calorizing Co. and prior to that had been associated with Julian Kennedy, Pittsburgh.

James Cleary, formerly manager of the Philadelphia office of the Combustion Engineering Corporation, will assume management of the Detroit and Cleveland territories with headquarters in the Book Building, Detroit. Frank Henderson will continue in charge of the Cleveland office and Joseph Lappin, formerly in charge of the Detroit office, has been assigned to New York for special work.

L. M. Waite, formerly general manager of the Garvin Machine Co., New York, has been appointed general manager of the Higley Machine Co., South Norwalk, Conn., manufacturer of cold saws and bakers machinery. Mr. Waite assumed his new duties Nov. 1.

Jean A. S. A. Bolinder and Ake Fagerkiold, both of the I. & C. G. Bolinder Co., Stockholm, Sweden, manufacturer of stoves, machinery and tools, attended the recent convention of the American Foundrymen's Association at Milwaukee.

H. E. Byer has been appointed manager of condenser and vacuum pump sales for the Chicago Pneumatic Tool Co., with headquarters in New York.

Lawrence Wood has been appointed Detroit district sales manager of the Colonial Steel Co., Pittsburgh, succeeding the late George W. Hampshire. Mr. Wood was formerly Pittsburgh district sales manager of the company and the vacancy created by his promotion and transfer has been filled by the appointment of R. M. Brushingham.

J. H. J. Adams has succeeded Norman E. Horn as advertising manager of the Winchester Repeating Arms Co., New Haven, Conn. Mr. Adams has been with the Winchester company for nine years and has been in the advertising department five years.

Henry M. Cleaver, formerly works manager of the Pond works, Niles-Bement-Pond Co., at Plainfield, N. J., is now assistant to the president of the Niles-Bement-Pond Co., with offices at 111 Broadway, New York. In machine tool trade in New York he is well known, having been in charge of the publicity department of the company for a number of years before he assumed charge of the Pond works about 10 years ago.

Lancaster P. Clark, recently New York representative of the Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., has been appointed manager of the metal department of the Warner Bros. Co., Inc., manufacturer of boxes and metal specialties, Bridgeport, Conn.

Louis W. Huber and Harold J. Sloman have been appointed instructors in the department of metallurgical and mining engineering at Carnegie Institute of Technology. Mr. Huber was graduated in mining engineering from Illinois University in 1921. After obtaining a master's degree at Illinois, he went with the La Selle Carbon County Coal Co., Carbon County, Ill., and more recently with the B. F. Sturtevant Co., of Chicago. Mr. Sloman was graduated at Lehigh University in 1917. Prior to his studies at Lehigh he had several years' experience in the bituminous fields of Pennsylvania. From 1919 to 1921 he taught in the mining department at Pennsylvania State College. He has been a mine foreman during the past few years with the Cambria Steel Co. and the Cosgrove-Meehan Coal Co.

Julian Chase, editorial director of the *Class Journal* Co., New York, has been elected president of the National Conference of Business Paper Editors, and Paul I. Aldrich of the *National Provisioner*, Chicago, has been elected vice-president. D. G. Woolf of the *Textile World*, New York, becomes secretary.

T. B. H. Askin has been appointed sales manager for the intermountain division, with headquarters in Denver, of the American Manganese Steel Co., Chicago Heights, Ill. He spent five years in mill operation and has had several years' experience in selling manganese steel.

W. A. Hicks and S. N. Hicks have been elected vice-presidents of the Penn Iron & Steel Co., Creighton, Pa. Lewis W. Hicks, formerly vice-president, was appointed president and general manager, following the recent death of George T. Lewis.

R. C. Broach, formerly in the sales department of the Heine Boiler Co. at St. Louis, has been appointed southeastern district manager, with offices at 709 Glenn Building, Atlanta, Ga. The territory consists of Eastern Tennessee, North and South Carolina, Alabama, Georgia and Florida.

Alexander Oldenbourg, a publisher of metallurgical and other engineering literature at Munich, Germany, and Fritz Bagel, head of a printing house at Dusseldorf from which *Stahl und Eisen* has issued for a number of years, sailed from New York last week after a stay of several weeks in the United States.

George G. Titzell, Jr., has been appointed assistant district sales manager in St. Louis of the Carnegie Steel Co., Pittsburgh. Mr. Titzell was formerly resident sales agent of the company at Kansas City. He succeeds Lawrence F. Miller, who recently resigned to become general manager of sales for the National Enameling & Stamping Co., St. Louis.

OBITUARY

BRUNO V. NORDBERG, founder and president Nordberg Mfg. Co., Milwaukee, and a noted inventor of steam and pneumatic devices, died on Oct. 30, aged 67 years. He had been ill for about two years. Mr. Nordberg was born in Finland and was graduated from the University of Helsingfors, coming to America in 1880. His first position was that of a trucker in the old Reliance works of the E. P. Allis Co., Milwaukee, but his rise was rapid, due to natural inventive genius and designing capabilities. After ten years with the Allis works, he established a shop of his own to manufacture automatic governors, but since that time the industry has greatly extended its scope and now ranks as one of the principal manufacturers of Uniflow, Diesel and Corliss engines; steam and electric mine hoists; air and gas compressors; blowing engines, condensers, underground shovel loaders. A large gray iron foundry also is operated and special machinery is designed and manufactured. One of the most notable inventions of Mr. Nordberg was the Nordberg regenerator for steam engines, which effected new high records for steam economy. The Nordberg air pressure power system, in use in the Montana mines of the Anaconda Copper Co., and in the Michigan mines of the Champion Mining Co., also is regarded as a valuable development. Due to illness, Mr. Nordberg retired as president of the company during the past year, becoming chairman of the board. His son, Bruno V. E. Nordberg, is executive engineer of the company.

STEPHEN DOUGLAS BALDWIN, president Cincinnati Rubber Mfg. Co., died at his home in Cincinnati Oct. 26, aged 61. His first business connection in Cincinnati, 40 years ago, was with the Western Supply Co.; later he became manager of the Cincinnati and New York branches of the Whitman & Barnes Mfg. Co. He organized the Cincinnati Rubber Mfg. Co. in 1905, and had been president of the company since 1911.

In making a 30-day run in Buffalo, recently, a 2-cycle Diesel engine made 3,879,921 revolutions, or 89.8 per min. The average brake hp. was 615; average t.h.p., 778, and mechanical efficiency, 79.5 per cent.

JAPANESE BUYING EXPECTED

Renewed Interest in Wire Shorts for China—Uniformity of Tin Plate Prices Proves Obstacle to Competition

NEW YORK, Nov. 3.—Export inquiry is light and orders are almost exclusively for small tonnages. Chinese business has improved slightly in the past week to 10 days, and small tonnages of wire shorts are once more acceptable to Chinese merchants. This renewal of interest, it is believed, may have been stimulated by the low prices obtainable on shorts, resulting from the cessation of purchasing by Chinese users. Quotations as low as \$39 per ton, f.a.s. Atlantic port have been made and \$44 per ton, f.a.s. seems to be the top price at present. Lately the market has strengthened and it is doubted that as low as \$39 could now be done, but recent sales have been made at \$50 per ton, c.i.f. China, which is about \$42 f.a.s. There has been some small inquiry for tin plate, but no buying, and the usual small lots of nails and similar products are coming into the market from China.

Japanese business is light, but there is some inquiry for small tonnages of tin plate and it is believed in some quarters that there is a fair degree of activity in quiet purchasing of small lots. One exporter to the Far East recently booked 1500 boxes of tin plate for Japan and there are some small lots under inquiry, one of 2500 base boxes. Exporters who have been negotiating for tin plate in the past fortnight claim that the almost uniform level of prices obtained makes it difficult to compete successfully for business. On a recent inquiry, it is understood that not less than \$5.93 per box, c.i.f. Japan was quoted and makers all held firmly to original quotations despite counter offers, which contrasts with the lower prices that prevailed a month or

two ago. The Welsh tin plate market is reported to be on the same level with American quotations, the fluctuating exchange causing price variation in both markets. London offices of Japanese companies report the British price based on the American market. The black sheet market is holding firm at \$92 to \$93 per ton, while American makers and British prices are at about the same level except for occasional concessions to obtain business.

Bids opened Nov. 4, on slightly less than 11,000 tons of rails and accessories for the Imperial Government Railways, Japan. It is considered doubtful that the order can be secured for American makers despite concessions on their part, in view of the lower level of prices that have been quoted lately by French and Belgian makers. Even though American mills should quote as low as \$38.50 per ton, c.i.f. Japanese port, \$34 to \$35 per ton has been done by Continental rail mills in the recent past.

While there has been no official statement from the Japanese Government as to the status of the tariff on sheets and tin plate after March 10, when the Conventional tariff expires and these products return to the general tariff provisions, which increase the duty many times over, there is the belief in some quarters that steps may be taken to reduce this high duty slightly. An increase in the duty on black sheets from about \$2 per ton to almost \$14 per ton will undoubtedly encounter the objection of the galvanizing plants. The increase from about 20c. per box to close to 85c. per box on tin plate may induce complaints from such consumers as the large oil companies. It is suggested that possibly a considerably higher tariff than the present, but one representing a drastic reduction from the general tariff may be enacted to become effective after March 10. In the meantime, some speculative purchasing, where credits can be obtained, is expected to take place.

Lavite for Wire Annealing

The Geometric Tool Co., New Haven, Conn., has disposed of its interest in the Bellis Heat Treating Co. Arthur E. Bellis, president of the latter company, was the purchaser. The offices of the company will be removed at once to Branford, Conn., where a lavite wire annealing demonstration plant is being installed in the plant of the Atlantic Wire Co. W. E. Hitchcock of the latter company has been elected director and treasurer of the Bellis company to replace James W. Hook, resigned. Mr. Hook is president of the Geometric Tool Co.

The Bellis Heat Treating Co. is the patentee and owner of lavite, a salt bath process for annealing, hardening and tempering of carbon and high-speed steels and other metals. The company now proposes to broaden its scope by entering the wire annealing field which offers a very wide market for lavite.

The present need for real mechanics and the fact that it is obvious that employers sooner or later must train their own men were driven home to members and guests at the Employers' Association of Eastern Massachusetts at a meeting held Wednesday, Nov. 5 at Young's Hotel, Boston. The subject under discussion was apprenticeship in the metal trades. Among the speakers were C. K. Tripp, superintendent of apprentices General Electric Co., Lynn, Mass., L. S. Harding, Blake & Knowles plant, Cambridge, Mass., Worthington Pump & Machinery Corporation, and J. E. Nyhan, national secretary National Metal Trades Association. Mr. Nyhan recently was appointed secretary to succeed Mr. Fischer. Mr. Harding presented his report of the Milwaukee Apprenticeship convention this year.

The Hyman-Michaels Co., Chicago, has purchased the Aurora, Plainfield & Joliet Railroad, a traction line about 22 miles long, including rails, cars, and overhead wire. The road will be dismantled and the materials and equipment sold.

Between 800 and 1000 Trade Associations

In connection with its studies of trade association activities, the National Industrial Conference Board estimates there are between 800 and 1000 such associations of national or interstate character in the United States. The latest list of commercial and industrial organizations issued by the Department of Commerce, with which the conference board cooperated in its recent canvass, contains slightly over 11,000 names and the present analysis of the board shows that about one-tenth of this number can be classified as true trade associations.

Of the 11,000 organizations listed by the Department of Commerce 1,500 were interstate, national or international, 2,000 State, and 7,700 local organizations. The board points out, however, that chambers of commerce and merchants' associations make up the vast majority of the organizations so listed and that many local organizations are only subsidiary units of larger associations.

In view of recent legislation touching upon the regulation of business by Government, this analysis of types of trade associations is an important feature of the National Industrial Conference Board's attempt to clarify for the public and business community the present situation in the relation of trade cooperation and the federal anti-trust policy. As trade associations have become recognized as a representative medium for ameliorating trade abuses and improving industrial activity, the definition of what is a true trade association is of vital interest to business.

Production of beehive coke for the week ended Oct. 25 is given by the United States Geological Survey at 140,000 tons, compared with 147,000 tons in the previous week and with 276,000 tons in the corresponding week of last year. In 1924 up to Oct. 25, the total is given as 8,011,000 tons, compared with 15,608,000 tons in the corresponding period of 1923.

French Pig Iron Characteristics Defined

Phosphoric and Hematite Irons of Varying Compositions Used for Different Purposes—Analyses of Several Grades

BY VICTOR TRUANT

PARIS, FRANCE, Sept. 19.—During the first seven months of 1924 the French exports of pig iron to the United States amounted to 11,616 tons, compared with 17,416 tons for the corresponding period of 1923. The difficult conditions of the American market might be deemed responsible for this decrease in French exports this year. As they may grow larger with the improvement of the situation in the United States, American readers may be given a brief summary relating to the quality, yield, etc., of the different grades of pig iron they are able to find in France, and their useful application.

France makes two kinds of cast and forge iron: phosphoric and hematite. Phosphoric iron is subdivided into three categories:

Phosphoric chill-cast iron,
Semi-phosphoric chill-cast iron,
Phosphoric forge iron.

Phosphoric Chill-Cast Iron

In a general way the high-grade phosphoric cast iron, called No. 3 PL, involves the following characteristics:

Silicon	2.75 to 3.25 per cent
Manganese	0.50 to 0.60 per cent
Sulphur	less than 0.05 per cent (traces)
Phosphorus	1.70 to 2 per cent
Carbon	3 to 4 per cent

This quality of iron is used extensively in France, and its price is taken as an average basis rate for other qualities of iron. However, some founders in preference utilize a more silicious grade, called No. 1 PL, which contains from 3.25 to 3.75 per cent of silicon. This iron is quoted 5 fr. (about 28c.) per ton higher than No. 3 PL. Some other qualities of pig iron—lower in silicon—but having, nevertheless, the same characteristics, are:

- No. 4 PL—2.50 to 2.75 per cent silicon.
No. 5 PL—2.25 to 2.50 per cent silicon.

The price of these two grades is respectively from 5 to 10 fr. lower than No. 3 PL.

The sand-cast iron grade more generally used, No. 3 PR, contains over 2.50 per cent of silicon and a higher yield of sulphur than No. 3 PL (less than 0.10 per cent); the other characteristics, such as manganese, phosphorus, carbon, are alike. Its price is 5 fr. below that of No. 3 PL.

No. 4 PR and No. 5 PR, containing respectively from 2.25 to 2.50 per cent silicon and 1.75 to 2.25 per cent silicon, are similar on other points to No. 3 PR. Their price is 10 to 15 fr. lower than the basis rate of No. 3 PL.

Semi-Phosphoric Iron

It may be interesting to note that some furnaces in France are producing various grades of semi-phosphoric iron, two analyses of which are given:

Cleveland (Current Type), Per Cent	Cleveland (Fine), Per Cent
Si	2 to 3
Mn	0.40 to 0.80
S	less than 0.06
Ph	1.10 to 1.70
	0.45 to 0.60 and 0.60 to 0.90

Phosphoric Forge Iron

In some special fabrication, requiring the use of a certain grade of phosphoric forge iron, the following mixture is utilized:

Si	1 per cent, about
Mn	1 to 1.50 per cent
S	less than 0.10 per cent

Ph	1.80 per cent, about
Graphitic carbon	0.50 to 1 per cent
Combined carbon	3 to 3.50 per cent
Total carbon	4 per cent

Other types have less silicon and manganese, and these qualities are obtained easily by both open-hearth and electric furnaces.

Gray Iron.—This quality of pig iron is used generally in open-hearth and puddler ovens, or for the making of irons and fine steels. For malleable iron castings, the same qualities of pig iron are used, but with a lower yield of manganese.

The characteristics of the current grades are:

Si	1 to 1.50 per cent
Mn	2 to 3 per cent
S	less than 0.05 per cent
Ph	less than 0.10 per cent
Graphitic carbon	3 per cent, about
Combined carbon	1 per cent, about
Total carbon	4 per cent, about

White Iron.—This type of pig iron possesses the characteristics of gray iron, but with a noticeably lower yield of silicon, 0.50 to 1 per cent only.

Hematite Cast Iron

French grades of hematite cast iron generally are obtainable as follows:

1.—The current type of cast iron:

Si	3 to 3 per cent
Mn	0.60 to 1 per cent
S	less than 0.05 per cent
Ph	less than 0.10 per cent
Carbon	3 to 3.50 per cent

2.—An iron 3 to 3.50 per cent higher in silicon for special fabrication is obtained by blast furnace or electric furnace. According to the average basis rate of No. 3 PL, its price is usually from 10 to 15 fr. higher per ton (Si being quoted 12 fr. per unit and per ton). Owing to the present abnormal situation of the French market, the difference of price between hematite and phosphoric cast iron is 100 fr.

3.—Heavy grain black iron is used for making castings exposed to high temperatures, such as retorts, ingot-molds, etc. This iron contains a larger quantity of carbon and is as follows:

Si	3 to 3 per cent
Mn	0.80 to 1 per cent
S	traces
Ph	less than 0.10 per cent
Graphitic carbon	3.1 to 3.4 per cent
Combined carbon	0.4 per cent
Total carbon	3.5 to 3.8 per cent

This quality of iron stands hard treatment and is consequently quite economical, in spite of the average increase of 20 fr. per ton generally quoted over the current grade price. Such a quality of iron is, however, put into fabrication for large orders only.

For hard machinery and strain resisting castings, such as columns, pipes, etc., a less silicious hematite of medium grain is used and may be described as follows:

Si	1.60 to 2.50 per cent
Mn	0.80 to 1 per cent
S	traces
Ph	less than 0.10 per cent
Graphitic carbon	2.7 to 3 per cent
Combined carbon	0.4 per cent
Total carbon	3.2 to 3.50 per cent

For hard and tempered steel castings, such as railroad wheels, cylinders, etc., the French steel works use the following mixture: Gray iron, of compact and fine grain, mixed with a certain proportion of white iron:

Si	1.40 to 2 per cent
Graphitic carbon	2.50 to 2.8 per cent
Total carbon	3.20 to 3.50 per cent

For rolling mill cylinders and certain types of

tempered pig iron castings the following grade is used:

Si	1.5 to 2.5 per cent
Mn	2 to 3 per cent
S	traces
Ph	less than 0.08 per cent
Graphitic carbon	3 to 3.5 per cent
Combined carbon	0.5 to 1 per cent
Total carbon	3.8 to 4.5 per cent

As an improving addition for ordinary and mechanical castings the following semi-hematite grades are used:

	A—Per Cent	B—Per Cent
Si	.2 to .8 per cent	.2 to .8 per cent
Mn	.5 to 1 per cent	.40 to .60 per cent
S	traces	traces
Ph	.10 to .20 per cent	.60 to .80 per cent
Total carbon	.4 per cent, about	.4 per cent, about

For making engine cylinders the following semi-phosphoric grade is used:

Si	.250 to 3 per cent
Mn	.40 to .60 per cent
S	traces
Ph	.80 to 1 per cent
Total carbon	.4 per cent, about

CONDUIT PIPE REDUCED

Price Trend Is Downward on Some Products in Youngstown District

YOUNGSTOWN, Nov. 4.—The Youngstown Sheet & Tube Co. has reduced the price on rigid conduit pipe \$6 per ton by increasing the discount three points. For a long period the price of this product has remained unchanged and the reduction is attributed to keen competition for going business, and to some extent new market conditions arising from the elimination of the Pittsburgh price basing practice.

In this area, prices of semi-finished steel products are reported not very firm, with large billets quoted down to \$35.50 per ton. Non-integrated sheet rollers are endeavoring to break down the price of sheet bars, claiming the margin of profit at current quotations for the finished product is too close. One producer of full finished sheets, for instance, points out there has been a decline this year in the price of No. 22 gage automobile body stock from 5.35c, the price in January and February, to the current level of 4.60c, amounting to \$15 per ton.

The reduction in the price of sheet bars, which this interest and other non-integrated rollers are obliged to purchase on the market, has not been nearly so large, averaging about one-third as much. Current sheet bar prices of \$37 to \$37.50 per ton compare with a range the first two months of this year of \$42 to \$42.50, representing a reduction of \$5 per ton.

Price adjustments will be made on sheet bar contracts next month for the first quarter of 1925, and non-integrated sheet producers are already indicating to steel makers their unwillingness to continue contracts at the prevailing level on the semi-finished product.

Steel Barrel Manufacturers' Institute Organized at Cleveland

Steel barrel manufacturers, at a meeting held recently in Cleveland, formed an organization to be known as the Steel Barrel Manufacturers' Institute. The new organization starts with 23 members who are said to represent over 90 per cent of the productive capacity of the industry, and to include all of the old established companies. The officers of the institute are J. L. Considine, Petroleum Iron Works, Sharon, Pa., president; C. H. Draper, Draper Mfg. Co., Cleveland, vice-president, and D. S. Hunter, Cleveland, secretary-treasurer. The headquarters will be in the Bulkley Building, Cleveland.

One of the main purposes of the new organization is to provide a better means of cooperation in carrying out the program of simplification which the industry entered into some time ago with the Department of Commerce. Other activities of the institute will be the gathering of statistics for publication by the Department of Commerce, development of cost work among members, publication and distribution of a booklet of information containing official barrel specifications, standards and general data of value to buyers, the establishment of a credit and collection bureau, the development of trade practices and customs and the establishment of a transportation bureau to handle matters pertaining to classifications and rates.

The Institute starts with the following members: American Steel Package Co., Defiance, Ohio; R. E. Chapin Mfg. Co.,

Batavia, N. Y.; Cleveland Steel Barrel Co., Cleveland; Detroit Range Boiler & Steel Barrel Co., Detroit; Draper Mfg. Co., Cleveland; Erie Steel Barrel Co., Erie, Pa.; Hirsch Cooperage & Steel Package Co., Houston, Tex.; Manion Steel Barrel Works, Rouserville, Pa.; Metal Barrel Corporation, Peoria, Ill.; Meurer Steel Barrel Co., Inc., New York; National Enameling & Stamping Co., New York; National Steel Barrel Co., Cleveland; Ohio Corrugating Co., Warren, Ohio; Perfection Metal Container Co., Cleveland; Petroleum Iron Works, Sharon, Pa.; Pressed Steel Tank Co., Milwaukee, Wis.; Republic Steel Package Co., Cleveland; Republic Steel Package Co., Richmond, Cal.; Stevens Metal Products Co., Niles, Ohio; St. Louis Steel Package Co., St. Louis; Welded Steel Barrel Corporation, Detroit; Wheeling Steel Corporation, Wheeling, W. Va., and Wilson & Bennet Mfg. Co., Chicago.

Steel Companies' Offices Moving to Youngstown

YOUNGSTOWN, Nov. 1.—It is expected the principal executive and sales offices of the Trumbull Steel Co., Warren, Ohio, and the Sharon Steel Hoop Co., Sharon, Pa., will be located in the new First National Bank building, now under construction at Youngstown by the Mellon-Stuart Co., Pittsburgh contracting and engineering firm. The structure will be 13 stories.

H. T. Gilbert, vice-president and general sales manager of the Sharon company, has followed the action of President Severn P. Ker in purchasing a home at Youngstown, which is also the home of President Jonathan Warner of the Trumbull Steel Co.

The suggested removal of these offices to Youngstown will further concentrate the headquarters of independent steel interests in this city. Several years ago the Newton Steel Co. established its central offices in Youngstown. The principal interests in a number of the non-integrated sheet rolling plants at Niles, ten miles west of Youngstown, are in the latter city.

Malleable Castings in September

Returns from 137 malleable casting plants, reported by the Department of Commerce, Washington, show a production in September of 41,507 tons, compared with 36,727 tons from 138 plants in August. The current figure compares with 60,930 tons from 119 plants in September of last year and with a maximum for the 12 months of 72,807 tons from 133 plants last March, this being 66.5 per cent of capacity, compared with 36.9 per cent in the current month.

Shipments in September were 40,480 tons, the largest since May, this year. Orders booked during the month were placed at 48,729 tons and the capacity of the 137 plants is given as 112,349 tons per month.

Youngstown Companies Optimistic

YOUNGSTOWN, Nov. 3.—Producers here are generally optimistic with respect to steel business for the first quarter of 1925, which they believe will be in sufficient volume and at prices attractive enough to improve substantially the earning position of steel makers. With a favorable election result, little doubt is expressed about the immediate future.

No boom business is looked for, but a steady gain in unfilled tonnage is regarded as likely. The release of much tonnage yet this year is regarded as a likelihood. It is the general feeling the prices will strengthen materially during the first quarter of next year.

RUSSIAN IRON AND STEEL DATA

Comprehensive Figures of Recent Production Compared with Pre-War—Coal and Ore Mining

BERLIN, GERMANY, Sept. 19.—Direct advices show that the general condition of Russian industry during the past six months has not improved. The partial crop failure has reduced the nation's buying power both at home and abroad. The Nijni-Novgorod Fair proved such a failure that it may not be held at all in 1925, or may be moved to Moscow. The shortage of capital continues. The belated Labor Bureau statistics for June 1 show 1,250,000 registered unemployed in industry proper, against 1,095,000 on April 1, and 513,000 on Jan. 1, 1923. The Coal and Iron Trusts are trying to increase the intensity of labor, but, owing to numerous holidays, only 260 days per year are worked.

The foreign trade balance is kept active by rigid rationing of imports, but the volume of trade remains very small. Whereas average monthly imports in 1913 were 114,500,000 roubles and exports 126,700,000 roubles, in April, 1924, imports were only 12,300,000 (gold) roubles, exports 22,100,000 roubles, and in May, 1924, 15,000,000 and 24,400,000 roubles respectively. The railroads are working at one-third of their pre-war traffic, and covering 78 per cent of their expenditure, the deficit being made good by the State. The supply of railroad fuel has increased. In the first six months of 1924 the State railroad workshops accomplished in construction and repairs 73 per cent of the program laid down at the close of 1923.

Production Figures Recently Released

The Soviet Commercial Mission at Berlin has published precise data for the coal, ore, iron and steel branches from 1913 or 1914 down to the close of last year. The figures, which do not always agree with earlier fragmentary reports, are stated to be correct. The following shows the pre-war production of coal, the lowest production (1920) after the war, and the production of the last two years:

	Metric Tons of Coal	
	Donets District	All Russia
1913	25,287,280	35,822,740
1920	4,553,640	7,569,300
1922	6,648,530	8,704,330
1923	7,439,980	10,981,550

The figures for "All Russia" include Asiatic Russia. The figure for "All Russia" in 1913 includes 6,833,580 tons from the Dombrowa mines, owned by Poland since 1919. The per capita efficiency of coal miners is improving, but production per man is only 56 per cent of the pre-war figure. Coke production in 1923 was only 136,000 tons, against 4,300,000 tons in 1913. Here, however, production is slowly increasing.

A new official report estimates the workable iron ore in the whole republic, of sufficient richness to smelt, at 1,850,000,000 tons, but of this only half is registered as "certainly available." The movement of iron ore production has been:

	Metric Tons of Iron Ore
1913	10,640,000
1920	160,000
1922	225,000
1923	487,000
1924 (Estimate)	673,000

The number of miners in the Krivoi Rog ore fields, which before the war yielded 70 per cent of the whole output, is 5700. In view of the collapse of mining, smelting has largely been kept alive from stocks of ore existing since before the war. In May, 1924, were still available 2,235,000 tons of mined ore.

Manganese ore production, which in 1913 was 1,220,000 tons, whereof 955,000 tons came from the Caucasus and 265,000 tons from South Russia and the Urals, fell in 1921 to a low point at 12,000 tons. Production in 1923 was 320,185 tons, of which 194,040 tons from the Caucasus. Estimated production in 1924 is 410,000 tons. The export trade in manganese ore has revived:

	Metric Tons of Manganese Ore
1913	1,171,000
1919	5,438
1922	206,414
1923	403,431
1924 (first four months)	176,261

The output of pig iron in 1924 is estimated at 450,000 tons, of which 207,000 tons will come from South Russia. The most notable fact of recent years is that South Russia, which before the War produced more than three times as much pig iron as the Urals, now produces only about the same amount:

	Metric Tons of Pig Iron		
	All Russia	South Russia	Urals
1913	4,637,300	3,105,000	914,000
1921	113,921	29,024	68,517
1922	186,140	87,680	74,500
1923	386,208	167,797	166,470

Last January 24 blast furnaces were in operation, against 140 in 1913. Steel production, as in nearly all branches, reached its lowest level in 1920. The improvement began in early 1921 after Lenin proclaimed his "New Economic Policy," providing for a partial return to capitalistic industrial methods. Production of steel has recovered more rapidly than that of pig iron, but it remains less than one-fifth of that of 1913:

	Metric Tons of Steel Ingots	
	All Russia	Tons of Steel Ingots
1913	4,249,200	1,249,200
1920	161,750	161,750
1921	316,400	316,400
1922	356,775	356,775
1923	734,586	734,586
1924 (Estimated)	825,000	825,000

In steel, also, South Russia has lost its leadership. In 1913 it produced 2,730,000 tons, against 907,000 tons in the Urals and 612,000 tons in the Central Provinces; in 1923 it produced only 268,763 tons, against 235,561 and 220,262 tons respectively. Production of rolling mill goods has been:

	Metric Tons of Rolled Iron and Steel
1913	3,510,000
1919	179,280
1922	257,670
1923	564,266

The number of workmen employed in the State-controlled iron and steel trusts in April, 1924, was 157,640, against 299,780 in the whole iron and steel industry in 1913.

Steel and Electrical Goods

The Putiloff Works, the greatest Petrograd concern, is stated to be in very bad condition and to require complete renovation. The Council of Labor and Defense has voted 4,000,000 gold rubles for this purpose. A report of the "Gomsa" iron and steel concern states that its production costs are 62 per cent higher than before the war. The concern proposes this year to produce 500,000 puds (81,800 metric tons) of finished metal goods, as against 300,000 puds (49,100 metric tons) last year.

The electro-technical industry has made a certain recovery. Before the war this branch developed rapidly under protection of high tariffs. After a bad collapse, production in the business year ended Sept. 30, 1923, recovered to 44 per cent of pre-war production, or 72 per cent more than the production of the business year ended Sept. 30, 1922. The whole value of its production in the business year, 1923, was 25,899,500 gold roubles, of which 13,334,700 roubles was cables, 4,640,200 roubles machines, 3,798,800 roubles lamps. In the first half of 1924 goods worth 21,700,000 roubles were produced. Chief Holzmann of the electrical department has stated to the *Moscow Industrial Gazette* that output is being increased with the aim of dispensing with imported electrical wares.

Enameling and japanning work turned out by 83 establishments in 1923 is reported by the Census Bureau to have amounted to \$5,447,968, of which enameling accounts for \$4,427,258 and japanning to \$1,020,710. It must be noted that a large additional amount of enameling and japanning not entering into these figures is done by plants primarily engaged in other work. Comparison with the 1921 census shows a heavy gain from the 64 establishments and \$2,520,149 of product of that year. Wage earners have increased from 615 to 1,815, wages from \$1,017,595 to \$1,712,792, and the value added by manufacture from \$1,460,295 to \$3,625,689. The horsepower used in 1923 was 2727 and the coal consumed, 18,923 net tons.

Iron and Steel Exports Continue Small

Smallest Total, with Three Exceptions, in Eighteen Months—Imports About Equal to Recent Averages

WASHINGTON, Oct. 28.—Making a gain of only 1459 gross tons, exports of iron and steel in September aggregated 136,087 tons, against 134,628 tons in August. For September of last year the total was 172,499 tons. For the nine months ended with September of

this year it was 1,392,051 tons, compared with 1,475,494 tons for the corresponding period of 1923.

Imports of iron and steel in September amounted to 45,214 tons, an increase of 286 tons over incoming shipments in August and an increase of 8603 tons over

Imports of Iron and Steel in Gross Tons

(Monthly Averages)

	Total Imports	Pig Iron	Ferro- alloys	Manga- nese Ore and Oxide*
1909 to 1913, incl.	26,505	11,432	5,251	\$47,155
1914 to 1918, incl.	23,351	4,645	3,710	37,115
1919 to 1921, incl.	23,901	5,708	3,710	37,115
1922	59,545	31,954	9,117	31,204
January, 1923	120,078	33,935	5,120	829
February	67,704	35,793	9,234	4,636
March	106,197	72,344	9,030	12,799
April	77,903	36,371	7,221	14,071
May	75,883	39,764	10,482	12,734
June	68,019	30,033	12,794	36,138
Six months' average	85,964	49,706	8,980	13,535
July	53,464	19,760	12,381	23,824
August	45,439	14,564	7,334	23,026
September	36,611	8,353	9,744	35,175
October	29,882	9,349	9,372	16,842
November	26,364	9,299	5,073	14,790
December	27,009	12,355	2,307	12,003
Twelve months' average	61,217	30,652	8,343	17,171
January, 1924	26,675	10,587	3,033	23,081
February	42,269	15,482	4,847	4,430
March	39,278	16,919	3,941	46,067
April	50,969	17,171	7,371	29,729
May	66,801	25,220	5,501	31,993
June	60,569	28,697	2,347	24,726
Fiscal year average	42,115	15,643	6,105	23,807
July	30,410	13,511	1,435	12,287
August	44,928	16,189	1,120	16,160
September	45,214	16,347	3,578	6,269
Nine months' average	45,650	17,791	3,686	22,736

*Not included in "total imports."

†Included ferroalloys.

‡Average for three years, 1916 to 1918 only.

Imports of Iron and Steel Into the United States

(In Gross Tons)

Nine Months
Ended September

	September	1923	1924	1923	1924
Pig iron	8,353	16,347	336,817	160,123	24,896
Ferromanganese	8,756	3,486	73,650	8,280	8,280
Ferrosilicon	988	92	9,899	8,280	8,280
Scrap	10,608	7,567	151,370	45,287	45,287
Steel ingots, blooms, billets, slabs and steel bars	2,325	2,770	14,948	29,946	29,946
Rails and splice bars	2,423	1,709	22,522	33,884	33,884
Structural shapes	405	3,201	7,868	29,441	29,441
Boiler and other plates	262	502	1,574	3,247	3,247
Sheets and saw plates	276	122	1,948	1,987	1,987
Bar iron	512	217	6,783	3,326	3,326
Tubular products	261	4,169	3,288	43,761	43,761
Castings and forgings	148	252	2,176	2,142	2,142
Nails and screws	41	88	924	376	376
Timplate	60	17	8,691	932	932
Bolts, nuts, rivets and washers	5	26	155	133	133
Wire rods	827	236	3,022	5,373	5,373
Round iron and steel wire	252	254	3,007	2,817	2,817
Flat wire and strip steel	49	256	862	1,742	1,742
Wire rope and insulated wire, all kinds	60	3,903	840	13,153	13,153
Total	36,611	45,214	651,344	410,846	410,846
Manganese ore	35,175	6,269	162,413	204,628	204,628
Iron ore	261,609	181,220	2,297,144	1,441,071	1,441,071
Magnesite	1,746	9,175	62,505	56,702	56,702

Monthly Exports, January, 1923, to September, 1924

(In Gross Tons)

	All Iron and Steel	Pig Iron	Finished Material
*Average, 1912 to 1914	2,406,218	221,582	145,720
*Average, 1915 to 1918	5,295,333	438,462	1,468,026
Calendar year 1919	4,239,837	309,682	258,907
Fiscal year 1920	4,212,732	248,126	288,766
Calendar year 1920	4,961,851	217,958	216,873
Fiscal year 1921	4,168,619	129,541	82,549
Calendar year 1921	2,213,042	28,305	10,363
Fiscal year 1922	1,721,418	23,330	63,127
Calendar year 1922	1,986,297	30,922	107,201
January, 1923	123,190	2,482	12,253
February	133,902	2,786	9,357
March	163,920	2,881	14,066
April	177,471	1,844	14,863
May	203,389	1,848	16,859
June	171,183	2,960	12,278
Fiscal year 1923	1,816,329	31,891	137,757
July	168,558	2,966	8,357
August	161,426	3,117	11,232
September	172,490	2,148	12,610
October	152,511	3,294	13,442
November	186,956	3,198	16,347
December	177,844	2,750	11,073
Calendar year 1923	1,992,595	32,318	152,748
January, 1924	247,942	3,812	8,594
February	164,820	4,773	11,463
March	123,618	4,047	2,278
April	131,276	4,117	8,275
May	154,136	4,317	4,895
June	163,770	2,057	11,178
Fiscal year 1924	2,009,343	40,596	119,744
July	137,481	1,796	10,363
August	134,628	4,365	6,127
September	136,087	4,799	15,473
Nine months	1,392,051	34,083	83,115

*Calendar years.

Exports of Iron and Steel

(In Gross Tons)

Nine Months
Ended September

	September	1923	1924	1923	1924
Pig iron	2,148	4,799	23,076	34,083	34,083
Ferromanganese	45	108	3,265	3,253	3,253
Ferrosilicon	2	2	659	726	726
Scrap	9,681	2,668	49,214	87,205	87,205
Ingots, blooms, billets, sheet bar, skelp	8,366	14,592	87,967	68,689	68,689
Wire rods	4,244	881	23,919	14,426	14,426
Iron bars	630	259	11,314	4,244	4,244
Steel bars	11,717	6,139	122,840	78,551	78,551
Alloy steel bars	276	100	1,942	1,943	1,943
Plates, iron and steel	8,750	6,305	92,602	68,289	68,289
Sheets, galvanized	7,660	8,140	91,551	75,069	75,069
Sheets, black steel	8,227	11,395	77,415	110,960	110,960
Sheets, black iron	1,136	681	11,353	7,972	7,972
Hoops, bands, strip steel	3,349	1,945	29,857	26,542	26,542
Tin plate, terne plate, etc.	9,094	7,734	80,424	120,542	120,542
Structural shapes, plain material	9,984	9,098	101,010	87,741	87,741
Structural material, fabricated	9,790	6,228	59,809	54,072	54,072
Steel rails	32,772	18,713	197,822	157,935	157,935
Rail fastenings, switches, frogs, etc.	3,959	3,045	30,012	28,720	28,720
Boiler tubes, welded pipe and fittings	16,186	15,749	143,285	169,860	169,860
Cast iron pipe and fittings	2,983	1,978	20,880	20,638	20,638
Plain wire	7,976	2,027	70,182	31,166	31,166
Barbed wire and woven wire fencing	3,110	6,563	58,197	66,820	66,820
Wire cloth and screening	415	88	1,581	1,368	1,368
Wire rope	554	340	5,058	3,462	3,462
Wire nails	3,063	527	29,178	19,004	19,004
All other nails and tacks	634	478	6,748	5,489	5,489
Horseshoes	106	88	702	760	760
Bolts, nuts, rivets and washers, except track	1,567	1,471	14,234	13,292	13,292
Car wheels and axles	2,110	2,710	15,412	16,559	16,559
Iron castings	853	826	7,653	6,696	6,696
Steel castings	576	355	3,879	4,679	4,679
Forgings	336	57	2,454	1,179	1,179
Total	172,499	136,087	1,475,494	1,392,051	1,392,051

imports of September of last year. For the nine months ended with September, 1924, imports totaled 410,846 tons, against 651,344 tons for the corresponding period of last year. Iron ore imports increased to 181,220 tons in September, against 115,703 tons in August, while imports of manganese ore decreased to 6269 tons in September, against 16,160 tons in August.

With a total of 18,713 tons, steel rails made up the largest item of export in September. The largest shipments went to Cuba, which took 10,803 tons, while China was second, taking 3862 tons. Of the total exports of 11,395 tons of black steel sheets in September, Japan was the largest buyer, taking 8331 tons while Canada took the bulk of the small remainder, the movement to Canada involving 2350 tons. Of September tin plate exports amounting to 7734 tons, Japan was also the heaviest foreign buyer of this product, taking 2540 tons.

Of pig iron imports amounting to 16,347 tons in September, 6007 tons came from British India; 4905

DISTRIBUTION OF STEEL EXPORTS

**Analysis of Destination of Seven Principal Items
of Outgoing Tonnage for September and
for Nine Months**

SUPPLEMENTING the tables on the preceding page of this issue of THE IRON AGE, the distribution of exports of seven principal finished steel items appears in the tables here. This covers the outgoing tonnages of steel plates, rails, black and galvanized sheets, barbed wire, plain and galvanized wire and tin plate. The figures are for September of this year and last year and for the nine months ended Sept. 30 in each of the two years.

Canada took the bulk of the steel plates, as was the case last year. Aside from Canada, the distribution was scattered.

Galvanized sheets were well distributed, with Cuba, Philippine Islands and Canada in the lead in September, while Canada, Japan and Philippine Islands led Cuba in that order for the nine months' figures.

Japan was much the largest purchaser of black steel sheets in September, followed by Canada in second place. The same was true for the nine-month period, Japan's purchases being more than two and one-half times those of Canada. This was not the case last year, when Canada in the nine months took almost twice as much tonnage of black sheets as was absorbed by Japan.

Of the steel rails shipped in September Cuba took the largest tonnage, with other countries far below

Sources of American Imports of Iron Ore

(In Gross Tons)

	September		Nine Months Ended September	
Spain	1923	1924	1923	1924
7,100	14,161	191,100	46,356	
Sweden	75,542	76,274	674,624	229,894
Canada	580	705	29,959	3,777
Cuba	75,175	13,396	602,176	221,186
Chile	60,000	39,300	437,400	761,445
French Africa	15,300	36,100	290,328	150,682
Other Countries	27,912	1,284	77,557	28,331
Total	261,609	181,220	2,297,144	1,441,071

tons from France and 4100 tons from England. Tubular products amounting to 4169 tons were imported in September. These were made up chiefly of cast iron pipe, of which 2622 tons came from France and 1319 tons from Belgium.

and well distributed, in their absorption of rails. For the nine months Cuba led, with Japan a fairly close second and Canada third.

Barbed wire was sent more largely in September to Brazil than to any other country, with Argentina in second place and Cuba third. The same alinement was observed in the nine months, in which Brazil took more than the three next largest customers combined.

	September		Nine Months Ended September	
	1933	1934	1923	1924
Tin Plate:				
Canada	2,596	1,947	32,008	15,367
Japan	2,301	2,540	30,355	27,640
Cuba	891	881	4,724	4,465
Mexico	—	243	—	2,994
Argentina	—	390	—	7,338
Chile	295	82	1,560	1,809
Uruguay	773	—	2,986	346
China	763	183	6,555	33,167
British India	495	128	3,427	9,432
Hong Kong	—	—	—	9,321
Italy	—	35	—	2,361

Distribution of plain and galvanized wire in September was pretty general, with Canada in the lead and Mexico second. Canada led also in the nine months, with Japan second, Argentina third, Brazil fourth and Mexico fifth. Canada's tonnage in the nine months was almost equal to the two next largest.

Japan took the largest amount of tin plate in September, with Canada second. For the nine months, however, China was in second position and only slightly below Japan. Canada was third, with British India and Argentina next in order.

**Exports from United States by Countries of Destination
(In Gross Tons)**

Iron Ore Available for United States

(Continued from page 1205)

some additional tonnage in recent years and now are estimated to contain about 60 million tons of magnetite ore averaging 42 to 43 per cent iron in the crude state. This ore is crushed and concentrated and is used by local furnaces in eastern Pennsylvania. There are reserves of low-grade carbonate ore found in western Pennsylvania and Ohio, but these are not used at present.

In the Southern district, while the ores are not of so high a grade as in the Northeastern district, the reserve of low-grade ore is much larger. This district includes Alabama, Georgia, Missouri, Tennessee, Virginia, Kentucky, etc., and the total reserve is estimated by Eckel to be from 2½ to 3 billion tons of ore, mostly Clinton hematite averaging 35 to 45 per cent iron.

Table II—Reserves of the United States			
District	Known Reserve	Per Cent Iron	Potential Reserve
Lake District	2,000,000,000	50	70,000,000,000
	1,000,000,000	45	
Eastern—Magnetite	1,000,000,000	55 to 60	3,000,000,000
Clinton	1,000,000,000	35 to 45	
Southern—Clinton	1,000,000,000	30 to 40	2,000,000,000
Brown	1,000,000,000	25 to 40	
Others	500,000,000	40 to 60	
Western	500,000,000	40 to 55	
Total	8,000,000,000		75,000,000,000

This ore is high in silica and phosphorus and is used only in the Southern furnaces. Some brown and carbonate ores also are found in this district. The Birmingham district in Alabama, the largest producing district in the South, is said to contain a reserve of about one billion tons. About 8 million tons of ore was produced in the Southern States in 1923, of which 7 million tons was mined in the Birmingham district. Several large deposits of magnetite ore in Missouri, at Iron Mountain and in the Ozarks, average about 55 per cent iron, 7 per cent silica, and practically no sulphur or phosphorus, and are estimated to contain about 50 million tons.

Little is known about the ores of the Western States, which produce less than 2 per cent of the ore mined in the United States. Deposits are found in Utah, Wyoming, California, Texas, Washington, etc., and the grades vary from hematite to magnetite. Eckel estimates the reserves of the Western States to be from 300 million to 1000 million tons.

Canada

On account of the lack of exploration it is still difficult to make an accurate estimate of the reserves of iron ore in Canada, although hematite ore has been found in Nova Scotia, and fairly large deposits of magnetite in New Brunswick and Ontario. The reserve of high-grade ore for all of Canada can be placed at 300 million tons, but the potential reserve of low-grade ore is many times this amount, as the low-grade ores are especially abundant in the Lake district.

Newfoundland

Newfoundland contains one of the largest iron ore reserves in the world, and certainly the largest reserve for the area covered. This ore body lies within a radius of five miles of Belle Island, in the Wabana basin, a great part of it lying under Conception Bay. There are three main seams or ore bodies and the ore is a fine grained hematite averaging from 48 to 57 per cent iron and from 6 to 12 per cent silica. The Stockholm report credits Newfoundland with 3635 million tons and Eckel allows 4 billion tons of recoverable ore, which probably is closer to the correct tonnage. Some ore also is found on the eastern part of Newfoundland, but at present it is not developed.

About half of the reserve of Newfoundland is owned by the Nova Scotia Steel & Coal Co., and at present Germany is probably the largest customer for Wabana ore, purchasing from 500,000 to 1,000,000 tons annually.

We cannot count on over half of the above reserves for consumption in the United States.

Mexico

Due to lack of fuel inland, the iron deposits near the coasts of Mexico are the only ones of international importance. Deposits found have been of both magnetite and hematite, averaging 55 to 65 per cent iron, and most of these deposits are located in the States of Guerrero, Michoacan, Oaxaca and Pueblo. The total reserve of Mexico can be placed conservatively at 100 million tons of high-grade ore. The Bethlehem Steel Corporation owns about 1500 acres in the State of Michoacan, which contains between 25 and 50 million tons of ore averaging over 60 per cent iron.

Cuba

Cuba contains one of the largest reserves of iron ore, being estimated at over 3 billion tons. Practically all of this ore is brown hematite, with a little magnetite and hematite in the Pinar del Rio field. The Oriente

District	Known Reserve	Per Cent Iron	Potential Reserve	Per Cent Iron
Lake District	2,000,000,000	50	70,000,000,000	35
	1,000,000,000	45		
Eastern—Magnetite	1,000,000,000	55 to 60	3,000,000,000	30 to 60
Clinton	1,000,000,000	35 to 45		
Southern—Clinton	1,000,000,000	30 to 40	2,000,000,000	30 to 40
Brown	1,000,000,000	25 to 40		
Others	500,000,000	40 to 60		
Western	500,000,000	40 to 55		
Total	8,000,000,000		75,000,000,000	

Province on the north coast of Cuba contains the largest reserve, about 2½ billion tons of ore over 40 per cent iron, but the moisture is generally very high, from 30 to 35 per cent. This ore contains from ½ to 1½ per cent nickel and about 1½ per cent chrome. On account of its moisture this ore is dried and nodulized into a sinter which averages about 55 per cent iron, 4½ per cent silica, 13 per cent alumina, 2 per cent chromium, 1 per cent nickel, and low in sulphur and phosphorus. The famous Mayari mines of the Bethlehem Steel Corporation are in the Oriente Province. The Daiquiri, Jurugua and Cuero mines are on the southern coast in the Pinar del Rio field.

Cuba produces from one to two million tons of ore annually, practically all of which comes to the United States. The Bethlehem Steel Corporation owns more than two-thirds of the total reserve of Cuba, and most of the remainder is owned by the United States Steel Corporation and the Eastern Steel Co., so that practically all of this reserve will be available for United States consumption.

Porto Rico

There is a deposit of limonite and serpentine in Porto Rico similar to the Mayari deposits of Cuba, which is said to contain about 800 million tons of ore averaging from 20 to 50 per cent iron and from 11 to 18 per cent moisture. This ore can be dried and nodulized to yield a product which will average about 54 per cent iron. As yet there has been no operation in Porto Rico, but this supply probably will come to the United States in the future. Deposits of magnetite are found around Juncos and Torres near San Juan, but the deposits probably are not large enough to warrant any large expenditure at present for exploration and development.

Venezuela

The ore deposits of Venezuela are located in the delta of the Orinoco River and the ore is generally magnetite averaging about 65 per cent iron. The reserve is about 400 million tons, but the production always has been small, less than 100,000 tons annually, most of which is shipped to the United States.

Chile

The iron ores of Chile are scattered along the west coast, north of Valparaiso, and consist chiefly of high-grade hematite, mostly Bessemer, averaging from 60 to 65 per cent iron. The Bethlehem Steel Corporation is operating a property at Tofo, which is said to contain

at least 200 million tons of high-grade ore. Although the production of iron ore in Chile always has been low, generally under 100,000 tons annually, nevertheless it probably will be increased greatly in the future, and most of the tonnage will come to the United States.

Brazil

Brazil has probably the largest undeveloped iron-ore reserve in the world, being estimated at $7\frac{1}{2}$ billion tons of hematite ore averaging over 60 per cent iron. The principal deposits are in the State of Minas Geraes and the ores occur in huge leases interbedded with layers of siliceous iron bearing formation. The surface ore is soft, but becomes harder with depth. The deposits are too far from the coast to be of any immediate interest commercially and, on account of the lack of fuel, there is practically no iron industry in Brazil, so that the production of iron ore is practically negligible. The reserves are owned by French, German, Brazilian and American capital. Brazil also contains one of the

largest reserves of manganese ore in the Minas Geraes district, a large part of which is owned by the United States Steel Corporation.

Table III—Reserves of Iron Ore Available for the United States

Country	Actual Reserve	Potential Reserve
United States	8,000,000,000	75,000,000,000
Newfoundland	2,000,000,000(a)	2,000,000,000(a)
Mexico	100,000,000	
Cuba	3,150,000,000	12,000,000,000
Porto Rico	800,000,000	
Venezuela	200,000,000(a)	
Chile	300,000,000	
Brasil	2,000,000,000(b)	1,000,000,000
Canada		10,000,000,000(a)
Total	16,550,000,000	100,000,000,000
Tons of pig iron	9,200,000,000	18,500,000,000(c)

(a) Only $\frac{1}{4}$ of total reserve taken as available for United States.

(b) Only about $\frac{1}{4}$ of total reserve taken as available for United States.

(c) Assuming 3 to 1 ratio for potential reserve.

(To be concluded)

AMERICAN MACHINERY TRADE

Exports and Imports in September of Machine Tools and Other Machinery

WASHINGTON, Oct. 28.—Exports of machinery in September were valued at \$24,460,750, against \$30,286,511 in August, and \$25,494,407 in September, 1923. For the nine months ended with September of the current year they were valued at \$240,649,530, compared with \$214,404,283 for the corresponding period of last year. Exports of metal-working machinery in September totaled 3574 in number, valued at \$575,460, against 3763, valued at \$671,932 in August.

Machinery Exports from the United States

(By Value)

	September, 1923	September, 1924	Nine Months Ended
Locomotives	\$286,172	\$1,417,136	\$3,271,115
Other Steam Engines	41,553	212,833	918,834
Boilers	261,285	218,139	984,867
Accessories and Parts	155,809	326,579	4,068,756
Automobile Engines	307,743	204,061	2,891,102
Other Internal Combustion Engines	561,065	428,158	6,263,151
Accessories and Parts for	375,313	236,366	2,605,083
Electric Locomotives	326,452	468,634	2,982,739
Other Electric Machinery and Apparatus	756,642	534,967	5,280,357
Excavating Machinery	52,438	189,590	1,137,184
Concrete Mixers	38,999	49,288	401,684
Road Making Machinery	164,840	47,303	1,341,793
Elevators and Elevator Machinery	487,839	224,833	8,088,724
Mining and Quarrying Machinery	560,734	537,198	7,257,070
Oil Well Machinery	415,002	440,513	4,705,854
Pumps	705,363	600,076	5,458,311
Lathes	102,321	75,757	659,417
Boring and Drilling Machines	54,302	49,301	485,023
Planers, Shapers and Slotters	30,057	17,201	193,302
Bending and Power Presses	66,664	33,954	260,011
Gear Cutters	11,144	19,068	128,096
Milling Machines	23,066	71,013	311,976
Thread Cutting and Screw Machines	10,490	33,290	462,156
Punching and Shearing Machines	5,605	2,907	133,047
Power Hammers	18,321	36,139	123,322
Rolling Machines		13,188	19,849
Sharpening and Grinding Machines	114,779	134,770	771,298
Other Metal Working Machinery and Parts of	305,800	330,862	3,821,640
Textile Machinery	670,374	681,164	6,967,988
Sewing Machines	739,986	673,899	6,429,260
Shoe Machinery	106,633	1,051,503	6,480,193
Flour-Mill and Gristmill Machinery	135,407	9,987	865,573
Sugar-mill Machinery	837,558	1,109,783	3,259,494
Paper and Pulp Mill Machinery	153,217	83,903	1,084,855
Sawmill Machinery	29,641	41,350	507,783
Other Woodworking Machinery	115,430	63,294	866,478
Refrigerating and Ice-Making Machinery	160,785	159,013	1,712,066
Air Compressors	172,228	220,496	1,845,073
Typewriters	889,160	1,310,170	10,211,361
Power Laundry Machinery	63,508	75,834	745,730
Typesetting Machines	432,118	214,887	2,794,067
Printing Presses	373,415	260,197	3,304,873
Agricultural Machinery and Implements	5,522,863	3,874,742	40,001,188
All Other Machinery and Parts	8,372,510	9,988,146	71,235,800
Total	\$25,494,407	\$24,460,750	\$214,404,283
			\$240,649,530

Imports of Machinery Into the United States

(By Value)

	Nine Months Ended	
	September, 1923	Sept., 1924
Metal-working machine tools	\$28,451	\$15,056
Agricultural machinery and implements	166,674	134,272
Electrical machinery and apparatus	8,502	45,220
Other power generating machinery	110,753	558
Other machinery	195,937	405,305
Vehicles except agricultural	176,029	146,074
Total	\$686,346	\$746,485
	\$8,285,711	\$7,107,257

Metal-Working Machinery Exports

Nine Months Ended September, 1924

	September, 1924	Number	Value	Number	Value
Lathe	73	\$49,133	43	\$75,757	
Boring and drilling machines	187	34,018	176	49,891	
Planers, shapers and slotters	31	27,364	23	17,201	
Bending and power presses	38	24,192	21	34,954	
Gear cutters	24	33,438	8	19,088	
Milling machines	62	70,028	85	71,013	
Thread-cutting and screw machines	41	30,500	74	33,299	
Punching and shearing machines	12	4,956	11	3,937	
Power hammers	16	26,342	22	36,139	
Rolling machines	2	10,228	87	18,188	
Sharpening and grinding machines	271	238,458	259	184,770	
Chucks, center, lathes, drill and other metal-working tools	1,680	27,581	1,723	27,197	
Pneumatic portable tools	1,337	95,704	1,114	58,026	
Total	3,763	3671,932	3,574	\$575,460	

*Includes number of external and internal grinding machines only; "other sharpening and grinding machines" are reported now by weight instead of by number.

Henry T. Hearsey of Indianapolis, retired business man, has been appointed receiver for the Pioneer Brass Works, 1102 East Twenty-third Street, Indianapolis. The suit for receiver was brought by J. H. Brinkmeyer, president and stockholder, on representations that the company was unable to meet obligations. The receiver is said to be a friendly one.

The American Institute of Steel Construction will hold its annual meeting at French Lick, Ind., Nov. 13, 14 and 15.

BELGIAN PRICES DROPPING

Inland and Foreign Competition Forces Lower Iron and Steel Prices, to Keep Plants Running

ANTWERP, BELGIUM, Oct. 15.—The steel market is still far from recovering. On the contrary the situation is as bad as a fortnight ago. Yet, normally, the lasting firmness of foreign exchange should cause a proportional stability of prices for exported materials. Unfortunately orders are so scarce and per contra the want for orders so large that prices continuously and gradually drop.

German competition remains strong, within general lower quotations, which in consequence largely assists buyers in obtaining further concessions from makers, who have to look for new orders to keep their mills going. Obtainable prices are considered too low. As furthermore no improvement is foreseen for the near future, several makers already have reduced largely their production, while some even think of closing their works.

Prices Lower

In our last letter £5 15s. was the lowest reported quotation for bars; this week prices have gone down as low as £5 10s. f.o.b. Antwerp, i.e., \$24.75 or 1.12c. per lb. This price of course is good only for large quantities and favorable specification. For smaller lots and special specification prices ran up to £5 11s. 6d., in some cases even £5 12s. 6d., or 1.14c. maximum. The usual and largest buyers, such as Japan and China, still abstain from buying. Some orders came in from the Pacific Coast of South America and, on a smaller scale, from India.

Joists for export were offered and booked at fr. 510 to fr. 515, f.o.b. Antwerp, i.e., between \$24.50 and \$24.75, or 1.11c. and 1.12c. per lb., with an extra of fr. 10 to fr. 15 per ton for small quantities. Wire rods also underwent a reduction and are quoted for export at £6 2s. 6d. (\$27.60), against £6 5s. and £6 7s. 6d. last week. Luxemburg makers were, especially as regards bars and joists, rather on the high side.

Nominal steel prices were approximately as follows:

	Fr.	Per Lb.
Bars, basis prices.....	520 or \$25.00 or 1.13c.	
Joists and U-Iron.....	520 or 25.00 or 1.13c.	
Rods	600 or 28.85 or 1.31c.	
Corrugated bars	600 or 28.85 or 1.31c.	
Hoops	740 or 35.60 or 1.61c.	
Cold rolled steel hoops.....	1050 or 50.50 or 2.29c.	
Drawn steel, squares	1075 or 51.70 or 2.35c.	
Drawn steel, rounds	1050 or 50.50 or 2.29c.	
Drawn steel, hexagons	1160 or 55.80 or 2.53c.	
Spring steel	1050 or 50.50 or 2.29c.	
Rails	725 or 34.85 or ...	
Wire rods	690 or 28.85 or ...	

Prices for commercial iron went lower also, and were as follows, f.o.b. Antwerp, for export:

	Fr.
Commercial iron No. 2.....	535 or \$25.70
Commercial iron No. 3.....	560 or 26.90
Commercial iron No. 4.....	580 or 27.85

For home consumption makers quote about fr. 15 to fr. 20 per ton more, i.e., from 75c. to \$1. As for steel products, owing to the shortage of orders, prices remain mostly weak.

The market for semi-finished steel products has nearly the same aspect. For these commodities there is a larger demand, but business is difficult to develop. Prices were:

	Fr.
Thomas steel billets.....	470 or \$22.50 or £5
Thomas steel blooms.....	440 or 21.15
Thomas steel largets.....	490 or 23.55
Steel bands	680 or 32.70

It is reported, however, that somewhat lower prices would have been accepted by makers. For a good deal of business prices would still have to be reduced a good deal if one considers that English buyers offer not more than £4 17s. 6d., or at the highest, £4 18s. 6d., for billets, i.e., still 2s. 6d. under the above price.

Pig Iron

Without being able to say that the pig iron market is firmer, we may, however, report that it has become of better aspect. Prices have not gone lower. Home purchases have increased at the ruling prices, while the demand for export is much larger.

High-phosphoric pig iron is quoted between fr. 340 and fr. 350 f.o.b. Antwerp, or delivered at consumers' works. These prices are quoted by Belgian, Luxemburg and Lorraine makers. They are about \$16.85 f.o.b. Antwerp.

Semi-phosphoric pig iron (phosphorus under 1 per cent) costs fr. 370 to fr. 380, i.e., \$18, f.o.b. Antwerp, while Belgian Bessemer pig iron is quoted fr. 450, namely, \$21.60, or nearly £4 16s. Owing to the last prices, the importation of English hematite pig iron becomes more difficult. Some business, however, is still done on the basis of prices such as £4 12s. per ton c.i.f. Antwerp, for English East Coast hematite.

Mackintosh-Hemphill Co. and Early Rolling Mill Work at Pittsburgh

"Pioneering, Engineering and Building," a booklet recently issued by the Mackintosh-Hemphill Co., Pittsburgh, besides detailing the engine and rolling mill installations of that company in more than 50 years, gives some very interesting history of early days in the foundry industry of Pittsburgh. The Mackintosh-Hemphill Co. as it now stands is a combination of Mackintosh & Hemphill Co., the A. Garrison Foundry Co. and the Pittsburgh Iron & Steel Foundries Co. The Pittsburgh Foundry, which later became the A. Garrison Foundry Co., was established in Pittsburgh in 1803 and built the first foundry west of the Alleghenies. The story of that foundry was told in THE IRON AGE, Jan. 5, 1922. The Fort Pitt Works, the predecessor of Mackintosh & Hemphill Co., was established in 1815, and the foundry which became the Pittsburgh Iron & Steel Foundries Co., in 1837.

The component companies having been identified with the beginnings of the Pittsburgh foundry industry, the booklet has many illustrations that take the reader back to the early years of the nineteenth century. They include a reproduction of an 8-in. cannon ball cast at the Pittsburgh Foundry for use by Commodore Perry's fleet in the War of 1812; a stove front depicting Perry's victory, cast in 1813; a chilled roll cast in 1823, a drawing from Harley's patent for casting chilled rolls, bearing the date of March 3, 1835, which was acquired by the company. The history is set down in order from 1803 to 1922, with many historical reproductions from the early prints of the constituent companies. The author, J. Ramsey Speer, president of the company, is a great-great-grandson of Joseph McClurg, founder of the Pittsburgh Foundry and of the Fort Pitt works.

The record from 1866 to 1924 discloses the building of 294 engines for use in the iron and steel and non-ferrous industries, 510 rolling mills for the steel industry, and 156 mills for the non-ferrous industry. Its first blooming mill, a 30-in. mill, built in 1877 for Shoenberger & Co., now the Shoenberger works, American Steel & Wire Co., is standing today and in operation. The first plate mill was built in 1868 for Singer-Nimick & Co., Pittsburgh; the first universal mill in 1871, for the American Sheet & Boiler Plate Co., and the first reversing mill engine in 1878, for the Roane Iron Co. The record shows a 22-in. mill for rolling zinc built in 1875.

Other text and illustrations in the booklet do ample justice to the other products of the company, which include manipulators, couplings, roll lathes, crank shafts, straightening machines, pinion housings, reduction gears, gear drives, flywheels, presses, shears and rolls.

More than 2000 precision measuring tools and 45 styles and 3000 sizes of milling cutters, gear cutters and hobs are listed in catalog No. 29, recently issued by the Brown & Sharpe Mfg. Co., Providence. The book is of pocket size and the pages number more than 400. The numerous illustrations are unusually clear and the material included well arranged. Tables of weights and measures and other data used by mechanics are included as in previous catalogs.

BOOK REVIEWS

Electric Railway Practices in 1923. Edited by Henry H. Norris for the Charles A. Coffin Foundation. Pages 221, 6 x 9 in. Published by the American Electric Railway Association, New York.

The General Electric Co. in 1922 set aside \$400,000 to be known as the Charles A. Coffin Foundation. The income, about \$20,000 a year, is available for prizes to employees in the electrical field, recognition to lighting, power and railroad companies for improvement in service to the public, and fellowships and funds for research work. The American Electric Railway Association was invited to assist in carrying out the plans of the foundation, and appointed as its Charles A. Coffin prize committee C. D. Emmons, Britton I. Budd and James H. McGraw. The committee sent out a letter to all electric railroads in the United States inviting them to enter the competition. The period taken for the consideration of accomplishments was the year ended Aug. 15, 1923. Nearly a score of briefs were submitted and the award was made to the Chicago, North Shore & Milwaukee Railroad. It was decided that a digest of the salient features of all the briefs should be published and the present volume is the result. To an extent it furnishes a cross-section of the industry as it was in 1923. The book is divided into two sections. The first deals with methods used to secure more riders and more revenue, and the second relates to economies in operation which were introduced by various electric railroads. Some of the chapter headings in Part II are: Economical Maintenance and Good Management, Electric Railway Saving in Construction, The Accident Menace Can Be Controlled, and Satisfactory Relations with Employees. From the last named chapter it appears that group insurance is increasingly popular, that one road had helped 80 per cent of its employees to secure homes, that the representation plan had brought the men and management of another line into accord, also, that in a number of cases interest in educational work had been well sustained.

Production of Open-Hearth Steel: Fabrication de l'Acier au Four Martin. By A. Barberot, director of works of the Société Sainte-Marie et Gravigny, Saint-Dizier. A volume of an Industrial Encyclopedia published under the patronage of the Société des Ingénieurs Civils de France. Pages, 543, 6 x 9 in., 160 figures and illustrations, and a number of tables. 1923: Published by J. B. Baillière et Fils, Paris; price, 40 fr. pamphlet.

This volume is one of a series upon mining and metallurgy published under the direction of Leon Guillet, each volume of which is prepared by a specialist of wide experience in the subject he writes upon. Several of these works have appeared; the complete series will comprise 44 volumes.

A brief history of the open-hearth process is followed by a short chapter upon the refractories used in building open-hearth furnaces and the materials used in making the steel, the reader being referred to other volumes of the series for more detailed treatment of these subjects. The second chapter treats of the various fuels used, gas producers, reversing valves, burners or atomizers for tar and oil and pulverized coal, etc., 111 pages being given to these subjects. Chapter III covers the construction of open-hearth furnaces, 76 pages, with three large inserted tables giving the dimensions of furnaces which have proved satisfactory in service, with nominal capacities of from 4 to 100 tons. This chapter includes an interesting discussion of the relative advantages of fixed and tilting furnaces for the continuous process. Special forms of regenerator brick, replaceable heads, water cooling, computations for flues, regenerators, mixers, chimneys, etc., are given. No reference, however, is made to the McKune or Egler systems of head construction and burning of gases.

Chapter IV devotes 156 pages to operation of acid and basic furnaces, charge sheets, special steels, sampling,

furnace accidents, detailed study of the process and diagrams showing the progress of the process. The processes of Bertrand Thiel, Hoesch, Talbot, Duplex Kernoan and other methods are described and studied with considerable detail. The fifth chapter covers pouring methods, ingot molds, segregation, blow holes, pipes and a number of special methods used in securing sound ingots, hot tops, fluid compression, etc., top and bottom pouring, "killing" and the casting of large ingots for armor plate, forging and wheel blank ingots.

The sixth chapter discusses cranes, charging machines and other handling apparatus. The various types of apparatus are shown and plans and cross sections of a number of proposed and operating plants illustrating French, German, British and American plants. The last chapter takes up the thermal balance of the open-hearth process and the calculation of the cost of making steel, working with mixer metal, with scrap, etc., by several of the processes. A bibliography is given which covers, mainly, German and French books and articles on the open-hearth.

Illustrations and line cuts are particularly good. The discussion of the various processes presents their advantages and disadvantages without bias. Detailed operating logs and diagrams of the bath and cinder are taken from actual heats and are carried through to the chemical and physical properties of the product. M. Barberot has covered the technical and practical phases of the designing of the plant and its operation in producing steel with a thorough understanding of his subject and an ability to express himself clearly.

Calcul du Lit de Fusion des Hauts-Fourneaux. By M.-A. Pavloff, professor of iron manufacture at the Polytechnic Institute of Leningrad (Petrograd). Translated into French, from the second Russian edition, by Leon Dlouatch, with a number of additions and corrections by the author. Pages, vi + 178, 6 1/4 x 9 1/2 in. Five figures and a number of tables. 1924: Dunod, Paris; price, 22 fr. paper; binding, 3.50 fr. (additional) and up.

Professor Pavloff is well known in metallurgical circles, particularly in those connected with the manufacture of steel and iron. His study of blast furnace burdens was first presented in the *Revue de la Société Russe de Métallurgie* in 1914. After the publication of the second Russian edition, M. Dlouatch prepared a translation into French and, to make this work more useful to metallurgists of other countries, a number of the text examples which were peculiar to Russian practice were omitted and replaced with examples relative to blast furnace practice in France, Germany, Great Britain and the United States. In making these revisions a search was made through the technical journals and books upon or relating to iron metallurgy which had appeared prior to 1923.

The latest work of Rankin, Feild and Royster has been utilized, as well as that of Akermann, the former covering the temperature-viscosity relations of the ternary system $\text{CaO}-\text{Al}_2\text{O}_3-\text{SiO}_2$. The author shows four methods of making these computations, those of stoichiometry, which are not always convenient; Platz's method; the method based on the ratio of $\text{RO}:\text{SiO}_2$; and a fourth method in which the ratio of $\text{SiO}_2:\text{Al}_2\text{O}_3$ is used, the sum of $\text{SiO}_2+\text{Al}_2\text{O}_3+\text{RO}=100$ being employed. An extensive discussion shows the advantages and the disadvantages of the various methods. Extensive computations, covering a wide variety of fuels, ores and fluxes used in making iron for a wide variety of purposes, illustrate the use of these various methods in blast furnace practice.

The total quantities of iron and steel imported into Italy during the first half of 1924 have not far exceeded those recorded for the corresponding period of last year, although in the case of most other imports of industrial materials and manufactured products striking increases have taken place, according to a report to the Department of Commerce from Assistant Commercial Attaché Osborne at Rome. This may be due to the fact that the country's facilities to work up crude and semi-finished iron and steel became pretty well employed before the year 1924 commenced.

NEW TRADE PUBLICATIONS

Diesel Engines.—Busch-Sulzer Brothers-Diesel Engine Co., St. Louis. 96-page catalog recording 26 years of American Diesel experience, describing the engines produced for stationary and marine use by the company and giving many illustrations, both photographic and diagrammatic, of the engines and their details. The two-cycle engine is featured and many figures are given as to cost of operation of the engine, in comparison particularly with steam engines of both the reciprocating and turbine types. The record shows that about half of the horsepower for small stations, which has been produced by this company, consists of repeat orders.

Explosives Service Bulletin.—E. I. du Pont de Nemours & Co., Wilmington, Del. Four-page bulletin discussing factors in driving mine drifts and cross cuts. This takes up the correct drilling of the hole, the proper charge of the hole with the right quantity and the right strength of explosive and the firing of the shots in proper rotation to insure maximum breakage.

Water Filtration.—William B. Scaife & Sons Co., Oakmont, Pa., has issued Bulletin No. 194, which deals with filtration in general and includes illustrations of typical gravity and pressure filter installations for both industrial and domestic uses, as well as tables of sizes and capacities of filter units. This company, founded in 1802, is among the oldest in water purification equipment field and has many installations in steel plants.

McKim Gaskets.—McCord Radiator & Mfg. Co., Detroit. Catalog No. 17 of 16 pages covers gaskets of various metals—copper, aluminum, tin, zinc and monel—for various conditions of service and use. These are designed for locomotives, compressors, steam engines and boilers, pumps, turbines and a wide variety of other uses, and are shown in the catalog in a wide variety of stock sizes. Special sizes, as well as odd shapes, can be obtained as needed.

Glass for Industrial Lighting.—Macbeth-Evans Glass Co., Charleroi, Pa. Four-page folder dealing with Monax glass, "the shadow chaser," designed to get rid of shadows and thus minimize accidents and inaccuracy in the shop.

Wire Cloth and Screen.—Ludlow-Saylor Wire Co., St. Louis. In catalog No. 47 of 160 pages has been gathered a large amount of material showing by illustration and otherwise a great variety of wire cloth and screen material. It forms a most complete compendium of its particular subject. Screens of square and rectangular mesh in a profusion of arrangements are shown, in sizes ranging from 11/16 in. rod down to fine wire, as small as 0.009 in. Most of the examples show woven screen, some of it galvanized after being woven. The tables are numerous, showing both the sizes and varieties of screens and wires illustrated and also wire gauges according to each of the several systems in common use.

Suggestions for Foundry Practice.—Hillside Fluor Spar Mines, 38 South Dearborn Street, Chicago. Booklet, 3 1/2 x 6 1/4 in., 16 pages. Practical suggestions, covering cleaning the cupola, proper mixtures for clay daubs, preparing the cupola bed, making the breast, lighting the cupola, charging the cupola, charging the flux, handling the slag, regulating the blast, and the use of fluxes, including limestone, fluor spar and fluoricite.

Speed Reducers.—Foote Brothers Gear & Machine Co., 215 North Curtis Street, Chicago. Catalog No. 25, illustrated, 79 pages, 8 1/2 x 11 in. Gives descriptions of various types of speed reducers, including essential parts, dimensions and prices. Typical applications of speed reducers are shown.

Heat Treatment.—Automatic & Electric Furnaces, Ltd., 173-75 Farringdon Road, London, E. C. 1. Bulletin No. 33 pertaining to heat treatment explains the sources of economy to be found in steel parts which have been hardened in a super-heated electric furnace equipped with a non-magnetic detector.

Bolts, Screws, Nuts and Rivets.—Atlas Bolt & Screw Co., Cleveland. Catalog No. 24, 126 pages. In addition to lists and illustrations of the company's line of bolts, screws, nuts and rivets, the catalog contains reference tables giving wire gage standards and weights, steel analyses, screw thread, machine drill and other standards, suggested heat treatments for S. A. E. steels. Pages are also devoted to excerpts from the report of the National Screw Trade Commission.

Roller Shaft Bearing.—Allis-Chalmers Mfg. Co.,

Milwaukee. Four-page bulletin No. 4048 outlining advantages of the Allis-Chalmers Timken roller shaft bearing.

Electrical Insulation.—The Panelyte Co., Trenton, N. J. Booklet of 12 pages devoted to the distinctive qualities of Panelyte electrical insulation. Tables showing dielectric strength, tensile strength, specific gravity and other characteristics are given. Illustrations include applications of this material.

A. C. Watthour Meters.—Sangamo Electric Co., Springfield, Ill. Bulletin No. 67, 32 pages 8 x 10 1/2 in. Features of the company's type H watthour meter are described at length and component parts are clearly illustrated. The type H polyphase meters are also described, as well as the company's type HM maximum-demand register, current and potential transformers and portable test meters.

Power Transformers.—Wagner Electric Corporation, St. Louis. Bulletin No. 140, 16 pages, outlining the features of the company's transformers which are available in all ordinary commercial frequencies and voltages and in the oil-filled, self-cooled types or in oil-filled, water-cooled types. The illustrations include actual installations.

Phenolic Condensation Material.—Fibroc Insulation Co., Valparaiso, Ind. Booklet of 16 pages, under title of "Fibroc Facts." Information is given on how Fibroc is made. The characteristics and recommended uses of the various forms and grades are outlined in several pages.

Traffic Controls.—Reynolds Electric Co., 2650 West Congress Street, Chicago. Bulletin No. 401 describes an automatic controller or timer for stop-and-go traffic signals.

Plumbing Specialties.—Peerless Mfg. and Supply Co., 22 Warren Street, New York. Price list No. 22 of 12 pages, covering a variety of plumbing specialties carried in stock.

Molding Machines.—Adams Co., Dubuque, Iowa. Supplement B to catalog No. 30 describing and illustrating portable and stationary 36-in. jolt squeezers. Full details are given on the controlling mechanism, which is made up of the company's pressure regulator and service valve.

Pneumatic Sand Riddle.—Adams Co., Dubuque, Iowa. Supplement C to catalog No. 30. Devoted to the features of the company's sand riddle, which is mounted on wheels and is designed to straddle the sand heap. It is intended for use in mixing, facing, core sand, etc., and may be moved along without shutting off the power. Vibratory action is imparted by an air motor.

Electric Motors.—Triumph Electric Co., Cincinnati. Four page folder describing the general construction and operating advantages of the "T R Self-Start" motor, which is a constant-speed polyphase a. c. motor built in sizes from 3 to 125 hp. and any standard frequency, voltage and speed.

Exhaust Fans.—Diehl Mfg. Co., Elizabeth, N. J. Bulletin No. 1650. Direct connected motor-driven exhaust fans, available in various combinations of voltage and current, are described and illustrated. The motors are totally inclosed. Tables of dimensions of various types are included.

Underfeed Stokers.—Combustion Engineering Corporation, Broad Street, New York. Catalog E-5, 23 pages. Describes the construction and use of the company's type E stoker which is of the single retort underfeed type, and is adapted to coking and non-coking bituminous coals and to various refuse fuels. It may be applied to boilers from 150 to 600 hp. Illustrations are numerous and include sectional views of applications to various types of boilers. A page is devoted to typical evaporative tests. The catalog is unusually well made up.

Machine Tools.—Hill, Clarke & Co., 644 West Washington Boulevard, Chicago. Booklet of 34 pages under title of "The Green List" which describes a wide line of "re-manufactured" machine tools for sale.

Worm Gear Speed Reducers.—Horsburg & Scott Co., Cleveland. Sixteen-page illustrated booklet giving construction details, tables of dimensions and horsepower ratings of standard units. The units are available in all ratios from 5 to 1 to 8 to 1.

Flexible Couplings.—Foote Bros. Gear & Machine Co., 215 North Curtis Street, Chicago. Bulletin L-18, eight pages. Data is given on various types of the company's "IXL" flexible couplings and their advantages for different purposes. Tabulated data on shaft sizes, dimensions, weights and list prices are included.

TARIFF AGITATION IN GERMANY

Reciprocity and "Most-Favored Nation" Clauses—Controversy Over High and Low Duties

BERLIN, GERMANY, Oct. 9.—The coming German general customs tariff and the pending commercial treaties with Ally countries will influence strongly in the next few years the competitive market in iron and steel. The tariff is to replace the Buelow tariff of 1906. This was a general, "autonomous" tariff with relatively high duties, reduced by all-around "most-favored-nation" treatment clauses in commercial agreements with other countries. Germany's present aim as officially proclaimed is to continue this system, but the duties in the "autonomous" tariff of 1902 must be increased all around. The reason for this is that the duties are assessed in marks per weight, the usual weight unit being the double centner (100 kg. or 220 lb.); and that, as gold prices have risen greatly, the present effective (ad valorem) duties are lower than in 1902-14.

At present, under the Versailles Treaty, all Ally countries enjoy most-favored-nation treatment until Jan. 10, 1925. Their sales to Germany bear the lowest import duties which Germany concedes to any country; whereas, they can, and in fact do, impose maximum and even special duties on German goods. This is a purely political advantage, arising out of Germany's defeat. Germany fears that the Allies will continue to exploit their political superiority, to exact special concessions without granting mutuality. At the opening of the Franco-German commercial treaty negotiations in Paris, the French demanded a prolongation of the duty-free imports from Alsace-Lorraine—a privilege which the Peace Treaty granted for five years only. The privilege gives France an advantage in competition over other Ally countries and over the United States; and prolongation is being opposed in England, owing to the fact that through this privilege France has replaced England as chief textile supplier to Germany.

Cabinet Opposes Favoritism

The Marx Cabinet so far has rejected all suggestions that the Allies should continue to enjoy special privileges; and last week it decreed that after Jan. 10 next most-favored-nation treatment of countries which do not reciprocate shall cease, unless commercial treaties made in the meantime should provide otherwise. The cabinet so far has shown itself inclined toward a high maximum autonomous tariff, but its aim is to use this to exact concessions, so that the high rates would be reduced to all countries which might abate their maximum rates for German goods.

Early this year the cabinet prepared a general tariff draft, which was supposed to raise duties all around sufficiently to make up for the rise in gold prices. The cabinet already had shown high-protectionist tendencies by submitting a bill re-imposing the high pre-war food duties, adding again that the maximum duties would not in fact be imposed, as they would be reduced under treaties with food-exporting countries, in exchange for concessions. The draft contained high rates, up to 80 per cent above those of the 1902 tariff. This was strongly criticized on the ground that German prices are only about 33 per cent higher than before the war; so that the proposed rates would go much further than merely to restore the pre-war effective duties.

Demands for a "Scientific" Tariff

The Federal Economic Council (Reichswirtschaftsrat), rejecting the draft, expressed itself as opposed in general to any summary, indiscriminate increase in duties. It demands an "individualized" tariff, fixing the new duties on each class of goods according to the conditions and necessities of the industry concerned. The draft as revised came again before the council a fortnight ago. This time the proposed duties were more "individualized," but some were extraordinarily high. The duties on textiles were 100 to 200 per cent higher than in 1914, although textile prices have risen only 89 per cent.

Very high duties, up to 1000 gold marks per 220 lb., were imposed on certain chemicals at present duty-free, and enormous additions were made to the duties on motors and motor cars. On internal combustion motors of 25 kg. net weight or under the duty was to be 2 gold marks per "metric lb." on motor cars of 22 double centners weight or under, duty 300 gold marks per double centner; motor cycles of any weight, 150 gold marks per double centner. The Economic Council showed itself emphatically against these proposals. It passed a resolution declaring in general against high protection, and demanded that a moderate maximum tariff be framed, and that the rates should be reduced further by "universal, unqualified, most-favored-nation agreements."

General Desire Is for Moderation

The Economic Council represents no particular industry and not even industry alone. It represents agriculture, industry, trade, banking, insurance, the professions and the consumer, and in each branch it represents both employers and employed. It undoubtedly expresses the national wish. Some individual industries, such as the motor car and the aluminum (both of which dread American competition), clamor for prohibitive rates. But numerous economic and commercial associations of general character have passed resolutions for a moderate tariff. The motor car dealers, for instance, oppose the manufacturers' demand. The high protectionist movement, which seems to have originated in official circles, has been prejudiced further by recent price movements.

Immediately after the plan for restoration of the food duties was announced, prices of breadstuffs, which had been 15 per cent under those of 1914, rose enormously, and now are much higher than before the War, and rye, the most important grain for Germany, of late has been actually dearer than wheat. While the cabinet took steps (already reported from here to THE IRON AGE) to reduce prices, and in fact brought down coal, iron and steel prices materially, the general price level has continued to rise. Thus the official wholesale index this week shows 133.7, against 119.7 two months ago, and the cost-of-living index has risen in the same time from 114 to 119. It therefore has become doubtful whether the food duties bill will pass the Reichstag, and it is equally doubtful whether the plans for materially raising the rates of the 1902 tariff will succeed.

Industrial Finance

Sale of the Hill Pump Works of the Midwest Engine Corporation at Anderson, Ind., to Huntile Gordon, pump manufacturer, representing Boston interests, for \$215,000, has been approved by Judge Mahlon E. Bash in Probate Court at Indianapolis. The new management will continue to manufacture pumps. Theodore Frazier of Anderson and associates submitted a bid of \$177,810 which was \$1,000 above the appraised value. The Union Trust Co. of Indianapolis, and Charles Jewett have been receivers for the Anderson plant and other property of the Midwest Corporation in Indianapolis for several months. The receivers have been offering the Indianapolis plant, which is valued at \$1,000,000, for sale for some time.

Following a decree of foreclosure, all real estate and plant of the Central Metal Products Corporation, formerly the Empire Art Metal Co., situated at College Point, L. I., will be sold at public auction on Oct. 21, at the factory office, Fourteenth Road and 118th Street, at 11 a. m. Appraised value of the plant is \$450,000 and it was built and equipped in November, 1913. The plant is equipped to manufacture interior steel doors and trim for buildings. Machine shop equipment consists of: three shapers, five engine lathes, one 18 ft. planer, three drill presses, four power hack saws and two gas hardening furnaces with quenching tanks.

The Wyman-Gordon Co., Worcester, Mass., drop forgings, has filed a statement of financial condition as of June 30, last, showing total assets and liabilities of \$6,516,889, contrasted with \$6,301,201 at the close of the previous year. Among the assets are \$649,092 in cash, \$2,096,694 in Government securities and \$91,625 in other securities. During the year capitalization was reduced from \$4,112,900 to \$3,961,300. Surplus at the close of the year stood at \$1,564,166, against \$1,228,981 on June 30, 1923.

Machinery Markets and News of the Works

Moderate Improvement

Volume of Sales in October Larger Than September

Inquiry for Ten Punches and Shears—Large Purchase for Export to Japan

ALTHOUGH for the most part the market has been quiet, improvement is reported in some centers, notably Cincinnati. A fair gain in the volume of sales last month over September has been noted also. With the election out of the way, further improvement is expected.

The Union Metal Products Co., Chicago, is in the market for 10 single and double-end punches and shears.

One of the largest purchases of recent months was made during the week by a representative of a Japanese manufacturer of automotive parts, involving complete equipment for a large plant in Japan. Orders

placed in Cincinnati include milling machines, radial and upright drills, planers and engine lathes.

Some equipment for Russia has been contracted for, additional equipment being on inquiry.

Orders have been placed by the Ajax Motors Co., Racine, Wis., for approximately \$150,000 worth of cylinder block manufacturing equipment. This company is now buying crankshaft machinery, and later on is expected to place orders for standard machine tools.

Purchases on the recent list of the White Motor Co. are being completed, and it is understood that a new list is being prepared and will be issued shortly.

The Illinois Merchants Bank, Chicago, has closed for \$7,500 worth of tool-room equipment.

The Reeves Brothers Co., Alliance, Ohio, is buying equipment for its new fabricating shop in Birmingham. During the week, this company placed orders for 20 used machines.

Eight slightly used machine tools are wanted by the T. W. & C. B. Sheridan Co., New York. The items included in the list are given in the New York market report below.

New York

NEW YORK, Nov. 3.

THE pre-election dullness that has prevailed for so long has been giving way in the past week before a growing interest in the purchase of single tools and generally improved sentiment among prospective buyers. Activity in actual purchasing is still largely contributed by the railroads. Renewed buying is noted from the New York purchasing office of a Russian cooperative organization, which some time ago bought several machine-tools. Award of tools for the manufacture of oil well drilling equipment is reported to have been made by this buyer and inquiries have been issued for a short list, including boring mills, turret lathes and grinding machines. The Kansas City Southern Railway Co. has closed on a combination journal turning and axle lathe, the Southern Railway on a 5-ft. radial drill and the Chicago, Burlington & Quincy on a 48-in. car wheel borer. The Griffin Wheel Co., Chicago, is also the purchaser of a 48-in. car wheel borer.

Slightly used machine tools of reputable builders are wanted by T. W. & C. B. Sheridan Co., 401 Broadway, New York, manufacturer of embossing presses and bookbinders' machinery. New tools will not be considered. E. R. Seiter is purchasing agent. The tools wanted are as follows:

- One 36 in. x 10 ft. or 12 ft. planer, Gray or Cincinnati.
- One 42 in. x 10 ft. or 12 ft. planer.
- One No. 5 Cincinnati horizontal milling machine.
- One medium sized bevel gear generator, Gleason or Sundstrand.
- One large shaper 24 in. or 28 in., Niles or American.
- One Bullard type boring mill, 36 in. or 42 in.
- One 14 in. x 6 ft. or 8 ft. lathe.
- One 16 in. x 6 ft. x 8 ft. lathe, Lodge & Shipley or American.

H. I. Feldman, 562 Fifth Avenue, New York, architect, is asking bids on a general contract for the erection of a two-story automobile service, repair and garage building, 100 x 130 ft., at 311 East Ninety-seventh Street, New York, estimated to cost \$100,000.

The Dubiller Condenser & Radio Corporation, 48 West Fourth Street, New York, plans the construction of an addition to its local works.

Saltser & Weinsler, 175 Cook Street, Brooklyn, N. Y., manufacturer of plumbers' and steamfitters' supplies, will soon begin the erection of their new four-story plant, 90 x 170 ft., estimated to cost \$100,000. A general building contract has been let to Walzer Brothers Corporation, 44 Court

Street, Brooklyn. Tobias Goldstone, 50 Graham Avenue, Brooklyn, is architect.

Howard Smith, Caledonian Colliers, Ltd., 35 Market Street, Melbourne, Australia, has inquiries out for transformers, switchboard apparatus, fans, pipeworks, turbo-alternators, condensers, pumps, boilers, etc.

P. W. Stange, 64 North Ninth Street, Brooklyn, N. Y., operating a machine works, is planning to purchase one milling machine, one planer, two shapers, one drill press and three lathes.

L. M. Kaufman, 1947 Broadway New York, architect, has plans for a four-story automobile service, repair and garage building 50 x 90 ft. at 182 Ludlow Street, estimated to cost \$60,000.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Nov. 11 for 49 steam and water valves, 500 air and drainage cocks, 748 Bibb cocks, 66 gate valves, 80 steel steam and water valves, 389 air valves, and 75 composition steam and water valves, for the South Brooklyn Navy Yard, schedule 2831.

E. Goldberger, 459 West Broadway, New York, manufacturer of mechanical and other toys, has awarded contract to Donald MacDonald & Co., Grand Central Terminal, for a two-story, brick plant 100 x 100 ft., at 12 Debevoise Avenue, Brooklyn, estimated to cost \$75,000. Missac Thompson, 191 Montague Street, Brooklyn is engineer.

Becton-Dickinson & Co., Rutherford, N. J., manufacturer of atomizers, has plans for a one-story addition, estimated to cost \$35,000 with equipment.

Tentative plans are under consideration by the Ballard Oil Equipment Co., Avenue R, Newark, N. J., to rebuild the portion of its plant destroyed by fire Oct. 25 with loss reported at \$100,000 including equipment.

The Board of Education, City Hall, Broad Street, Newark, plans the installation of manual training equipment in the new three-story high school to be erected on Van Buren Street, estimated to cost \$250,000, for which plans were prepared by J. F. Cook, Union Building, Newark, architect.

The Fagan Iron Works, Fourteenth Street, Jersey City, N. J., has preliminary plans for rebuilding the portion of its pattern shop destroyed by fire Oct. 28 with loss estimated at \$40,000 with equipment.

L. Leslie Hoadley, 611 Eighth Street, Ocean City, N. J., architect, has plans for a two-story, automobile service, repair and garage building, 60 x 100 ft., to cost \$40,000.

The United States Cast Iron Pipe & Foundry Co., East Burlington, N. J., will proceed with the construction of its one-story foundry addition, 120 x 600 ft., with extensions, 60 x 500 ft.

The Crane Co., 836 South Michigan Avenue, Chicago, has awarded contract to the Willcox Construction Co., 1

Bridge Plaza, Long Island City, for its one-story branch and distributing works at Irving Avenue and Schaefer Street, Ridgewood, Brooklyn, to cost \$55,000. Raymond & Hood, 18 East Forty-first Street, New York are the architects.

Buffalo

BUFFALO, Nov. 3.

THE F. A. Austin Pattern Co., 301 Wallace Street, Syracuse, N. Y., has awarded contract to the J. D. Taylor Construction Co., 115 South Salina Street, for a one-story addition to replace a structure destroyed by fire. It is estimated to cost \$35,000.

The American Laundry Machinery Co., Rochester, N. Y., has tentative plans for rebuilding of the portion of its works, destroyed by fire Oct. 27, with loss of \$650,000, including equipment.

The Board of Education, E. J. Hunter, head, Ilion, N. Y., plans the installation of manual training equipment in the addition to be erected at the local high school, for which bids will be asked about Nov. 15. It will be two-stories, 45 x 112 ft., estimated to cost \$180,000 with equipment. Kinne & Frank, Mayor Building, Utica, N. Y., are architects.

Plans are being considered by the Lawler Iron Works, Ferry Street, Buffalo, for the rebuilding of its plant, recently destroyed by fire, with loss of \$25,000.

J. P. Healy, Springville, N. Y., has inquiries out for a natural gas engine, capacity 100 to 150 hp., with direct-connected generator.

Bids will be received until Nov. 17 by the Board of Water Commissioners, Village Hall, Brockport, N. Y., for improvements in the pumping station and installation of new equipment, as per specifications. Bert A. Thompson is clerk.

M. Connor, 39 Niagara Street, Lockport, N. Y., is in the market for a two-jaw wrenchless truck for No. 5 Warner & Swasey screw machine, and 8-in. Foster Barker.

D. S. Roszma, Route 5, Lockport, N. Y., has inquiries out for a combination wood-working machine.

The Houde Engineering Co., Buffalo, has filed plans for a brick factory at 237 Winchester Avenue, to cost \$50,000.

Contract has been awarded to Chapman & Graham, Jamestown, N. Y., by the International Casing Co., 84 Hopkins Avenue, Jamestown, for a one-story triangular brick addition. The company manufactures metal window frames.

John E. Jackson & Son, 48-50 Market Street, Jamestown, N. Y., operating a service station, have preliminary plans for a three story, 50 x 100 ft. garage and repair shop on adjoining property. A cylinder reborning machine, drill press, lathe and other electrically operated machinery will be required.

Philadelphia

PHILADELPHIA, Nov. 3.

THE Bureau of Supplies & Accounts, Navy Department, Washington, will take bids until Nov. 11 for 10,300 ft. of lighting and power wire; 100 ft. sheathed varnished cable, cloth insulated; and 1000 ft. of rubber insulated wire, for the Philadelphia and Mare Island Navy Yards, schedule 2841.

The Union Sewer Pipe Co., McKeesport, Pa., is considering preliminary plans for the rebuilding of its plant on the Youghiogheny River, opposite Versailles, destroyed by fire Oct. 24, with loss of approximately \$100,000 including equipment.

Manual training equipment will be installed in the new two-story and basement high school at West View, Pa., estimated to cost \$150,000, for which plans are being prepared by G. H. Schwan, Peoples Bank Building, Pittsburgh, Pa. G. J. Lang is secretary of the board.

The Hoff Metal Products Co., York, Pa., operating with capital of \$500,000, plans the establishment of a works for the manufacture of metal tire grips and other automobile accessories. Carlton L. Hoff, York, is president.

The Central Tube Co., First National Bank Building, Pittsburgh, Pa., plans the installation of a 15 or 25-ton overhead electric traveling crane at its Ambridge, Pa., works, for which bids are being asked.

The Air Reduction Sales Co., 342 Madison Avenue, New York, is reported to have leased an existing building at Lebanon, Pa., for the establishment of a branch plant for the manufacture of industrial oxygen, and kindred products. The Industrial Committee of the Lebanon Chamber of Commerce is interested in the project.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received the following inquiries: 43798, from Carlos Barbosa, Praça Visconde do Rio Branco, 12, Paraíba, Brazil, desiring to get in touch with manufacturers of machinery for the production of sanitary cotton waste, equipped to remove linters from the cotton seed after ginning operations; 42500, from M. V. Peistrusof, 16 Rinochaya Street, Harbin, Manchuria, interested in getting in contact with manufacturers of railroad and tram cars, metal ceilings, chocolate machinery, flour milling machinery, textile and paper making machines; 42820, from D. A. Mesa & Compania, Medellin, Colombia, desiring to communicate with manufacturers of automatic piano rolls, electrical apparatus, talking machines, typewriters, automobile accessories; also, T-1351, from Jose A. Diaz Arias, Tres Cruces, No. 2, Santiago, Cuba, wishing to get in touch with manufacturers of hardware products and electrical implements.

Fire, Oct. 29, destroyed the plant of the Philadelphia Table Co., Inc., 1600 North Fifth Street, Philadelphia, with loss reported at \$200,000, including equipment. Tentative plans for rebuilding are being considered.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Nov. 11 for 416 gate valves; 2500 steam and water valves; 210 babb cocks; and 750 air and drainage cocks, schedule 2831, for the Philadelphia navy yard.

Plans are in preparation for a one-story building, 90 x 175 ft., at Woodland Avenue and Sixty-eighth Street, Philadelphia, for the Simplex Valve & Meter Co., 209 Fidelity Building, Philadelphia, manufacturer of water works supplies. E. A. Wightman, Bankers Trust Building, is architect.

Contract has been awarded to Whipple Brothers, Laceyville, Pa., by the St. Michael's Industrial School for Boys, M. J. Hoban, head, 315 Wyoming Avenue, Scranton, Pa., for its proposed two-story shop building at the Whites Ferry, Pa., industrial school, estimated to cost \$45,000 with equipment. Plans were prepared by Emilie G. Perrot, 1211 Arch Street, Philadelphia.

The Pennsylvania Railroad Co., Philadelphia, is inquiring for an alligator shear.

The Graff-Kittanning Clay Products Co., Worthington, Pa., will begin the construction of a three-story factory, 112 x 256 ft., estimated to cost \$50,000 with equipment. L. B. Pierce, company address, is engineer.

Property formerly operated by the Empire Slate Co., Slaterville, near Slaterville, Pa., has been leased by Hardig, Hoeck & Fouke, Slaterville. Extensions and improvements are planned, with the installation of new equipment.

The Haines, Jones & Cadbury Co., 1136 Ridge Avenue, Philadelphia, Pa., manufacturer of planing equipment, steam heating apparatus, etc., will commence the construction of its one-story plant, at Wilkes-Barre, Pa., 90 x 180 ft., estimated to cost \$55,000. A general building contract has been awarded the H. K. Ferguson Co., 6523 Euclid Avenue, Cleveland. J. Harvey Berton is president.

A building permit has been granted for the construction of a boiler plant at the Wistar Institute, Thirty-sixth and Spruce Streets, Philadelphia, estimated to cost \$45,000.

Detroit

DETROIT, Nov. 3.

THE A. D. Joslin Mfg. Co., 223 West Erie Street, Chicago, manufacturer of time stamps, etc., contemplates improvements in its Manistee, Mich., works, including additional equipment.

Hinchman & Grylls, 800 Marquette Building, Detroit, architects, have plans for an automobile service, repair and garage building, at Cass and Fort Streets, 38 x 165 ft., estimated to cost \$300,000 with machinery. Bids will be asked soon on a general contract.

The MacRae Steel Co., 11700 Russell Street, Detroit, plans the installation of conveying and handling equipment, factory trucks, etc., in its one-story building, 100 x 200 ft., at Miller and Abrey Streets.

The Board of Education, Manistee, Mich., is planning the installation of manual training equipment in the new high school to be erected on site recently selected. Plans are being prepared by J. N. Churchill, 306 Prudden Building, Lansing, Mich., architect.

The Wolverine Power Co., Edenville, Mich., has work under way on two hydroelectric generating plants on the Tittabawasee River, at Second and Smallwood and is arranging a list of equipment. Transmission lines also will be constructed. These plants, together with the work at Edenville and Sanford, will estimate \$1,750,000.

Manual training equipment will be installed in the three-story senior high and college building to be erected at Muskegon, Mich., by the local Board of Education. Paul Moon, secretary, High School Building, Muskegon, estimated to cost \$700,000 including equipment. H. H. Turner, 923 Michigan Trust Building, Grand Rapids, Mich., architect; W. B. Ittner, 911 Locust Street, St. Louis, Mo., consulting architect.

Cleveland

CLEVELAND, Nov. 3.

WHILE machine tool business continues slow, most dealers and manufacturers report a fair gain in the volume of sales last month over September. Some scattered orders for single machines were placed during the week. A few tools were purchased by the railroads, including a 90-in. drive wheel lathe by the New York Central for its Colliwood shops, a turret lathe by the Lehigh & New England Railroad and a turret lathe by the Kansas City Railroad. Five turret lathes were purchased from a local builder by a manufacturer of cotton mill equipment for installation in a new plant at Birmingham. The Reeves Brothers Co., Alliance, Ohio, is buying equipment for its new fabricating shop in Birmingham, and during the week placed orders for about 20 used machines.

The Ohio Structural Steel Co., Newton Falls, Ohio, will erect a one-story factory, 60 x 100 ft. M. H. Stauffer is general manager.

A factory, 60 x 100 ft., will be erected on East Seventy-sixth Street, Cleveland, by the Holden Realty Co. for the F. C. Thornton Co., 6712 Union Avenue, sheet metal worker.

The Art Iron & Wire Works, 2113 Canton Avenue, Toledo, Ohio, will erect a one-story factory, 60 x 141 ft. Miles, Rhines, Bellman & Nordhoff, Ohio Building, are architects.

A. C. Kloppen, 1678 Norwood Avenue, Toledo, manufacturer of metal stampings, will build a one-story addition, 41 x 97 ft. DeVore & Co., 921 Nicholas Building, Toledo, are the architects.

A manual training department will be provided in a senior high school to be erected in Mansfield, Ohio, plans for which are nearing completion. John A. Bristol is the clerk of the Board of Education.

The Fairmount Tool & Forging Co., Cleveland, contemplates the erection of a two-story factory to replace one recently damaged by fire.

The Champion Spark Plug Co., Upton and Avondale Avenues, Toledo, Ohio, is receiving bids on revised plans for a one-story and basement building, 65 x 160 ft., estimated to cost \$55,000. Mills, Rhines, Bellman & Nordhoff, Ohio Building, are architects.

New England

BOSTON, Nov. 3.

THE machine tool market continues to vary in activity. After about a week of moderate business, it has grown dull once more. Sales the past week were confined almost exclusively to used equipment the total probably not exceeding two dozen tools. There is also a noticeable decrease in new prospects. Sentiment in machine tool circles here in that business will materially improve this month. Although some local houses did practically nothing in October, others found the month the most active since early 1924.

Small tools and machine parts continue to move out of stock in good volume, high speed drills, heretofore generally quoted on a flat discount basis, are now listed at varying discounts, depending on the size. Large drills carry a smaller discount than small drills.

The Lewis-Shepard Co., 566 First Street, South Boston, automatic handling machinery, has purchased from the Boston & Maine Railroad 102,912 ft. of land at the Union Market Stockyards, Watertown, Mass., on which it proposed to erect a one-story plant having 75,000 sq. ft. of floor space.

The Hartford City Gas Light Co., Hartford Conn., has under contemplation the erection in 1925 of a new plant to cost in excess of \$3,000,000. The Koppers Co. is the engineer. Plans are in the initial stage, the project depending on the

sanction of the Hartford Common Council for an exchange of land.

The Thomson Electric Welding Co., Lynn, Mass., has awarded contract for a one-story addition. Haven & Hopkins, 11 Beacon Street, Boston are the architects.

Permission has been given Joseph E. Knox & Co., 380 Broad Street, Lynn, Mass., to erect a one-story, 42 x 113 ft. manufacturing plant and storage building. Plans are private.

Ashton, Huntress & Alter, 577 Essex Street, Lawrence, Mass., architects, have closed bids for a manufacturing plant, garage and ice house to cost \$100,000 to be erected at Western and Eastern Avenues, Lynn, Mass., by the Jersey Ice Cream Co., Lawrence. Trolley hangers and miscellaneous equipment are required.

Foundation work has begun on a new plant for Lombard & Co., Inc., 236 A Street, Boston, Mass., manufacturer of grindstones and other abrasive products, at Somerville, Mass., for which Clifford & Roebald, 101 Tremont Street, Boston are engineers.

The General Steel & Rubber Stamp Co., Inc., High Street, Boston, Mass., will install equipment for a complete plating unit at its works at Sixth and Harvard Streets, Cambridge.

The American Chain Co., Hollister Avenue, Bridgeport, Conn., has work in progress on its two-story and basement machine testing and mechanical laboratory building, 42 x 55 ft., for which T. J. Hardy Construction Co., 1481 Seaview Avenue, has the building contract.

C. A. Taggart, Highland Avenue, Norwalk, Conn., will begin work on a one-story plant, 21 x 100 ft., for the production of concrete and cement blocks.

H. Rosen, 112 Wisconsin Avenue, Somerville, Mass., is having plans drawn for a three-story service, repair and garage building, 55 x 130 ft., estimated to cost \$150,000.

The Twin State Gas & Electric Co., 160 State Street, Boston, is having plans prepared for a new power plant, at Portsmouth, N. H., with reported cost of \$400,000.

The Wood Hydraulic Hoist & Body Co., 3371 Washington Street, Boston, will begin work on a new plant at 316 North Beacon Street, estimated to cost \$32,000, exclusive of equipment.

Gulf States

BIRMINGHAM, Nov. 3.

E. M. JORDON, JR., city clerk, Cocoanut Grove, Fla., will take bids until Nov. 25, for equipment for the proposed municipal waterworks, including pumping station, electric generating machinery, motor-driven centrifugal pumps and compressors, steel tank, water softening plant and distributing system. The Maine Engineering Co., Daytona, Fla., is engineer.

The Texas Power & Light Co., Dallas, Tex., has acquired the municipal power plant and system at Cooper, Tex., and plans extensions and the installation of additional equipment.

Henderson & Fleming, Miami, Fla., have received contract for the erection of a three-story automobile service, repair and garage building in the Fort Dallas section, 115 x 175 ft., estimated to cost \$125,000, for which plans were prepared by Gordon E. Mayer, Miami.

P. C. Painter, city manager, Greensboro, N. C., will receive bids until Nov. 11 for improvements in the municipal waterworks, to include one 7,500,000 gal. centrifugal steam-turbine driven pump, boiler feed pump, one 250-hp. 175-lb. steam pressure boiler with steel casing, with pipe lines, also one 6,000,000 gal. centrifugal pump and equipment for the pumping station. M. M. Boyles, Greensboro, is water engineer.

The Raccoon Coal Co., Lincoln Life Building, Birmingham, W. L. Smith, president, has inquiries out for one air compressor with tank.

The Sugarland Industries, Inc., Sugarland, Tex., plans improvements in the plant of the Imperial Sugar Co., recently acquired, and the installation of additional equipment, estimated to cost \$1,000,000. G. D. Ulrich is vice-president.

The Victoria Lumber Co., Ltd., Shreveport, La., will install a 50,000-gal. steel water tank and tower at its plant, for which bids are being asked.

Fee & Stewart, Inc., Fort Pierce, Fla., manufacturer of hardware products, will erect a one-story building at its plant, 50 x 80 ft., estimated to cost \$45,000, including improvements in the present works.

The City Council, Dilley, Tex., will soon call for bids for electric pumping equipment, generator, tank and tower, for installation in the new waterworks plant to cost \$60,000. T. Bartlett, Calcasieu Building, San Antonio, Tex., is engineer.

The Crane Market

A FAIR volume of inquiries for single cranes is reported in the field of overhead equipment and there is evidence of a slight improvement in the locomotive crane market. It is generally believed that there are a number of inquiries for overhead cranes that have been delayed until after the election that will appear soon. The Phoenix Utility Co., 71 Broadway, New York, is expected to issue a call for bids this week on the 100-ton overhead crane mentioned as under consideration in last week's issue of THE IRON AGE. Action will probably be taken in the near future on the list of 101 small electric hoists inquired for by the American Steel & Wire Co. some time ago. An inquiry has been sent out by Henry W. Peabody & Co., 17 State Street, New York, exporters, for a steam or electric driven locomotive crane of about 5-tons capacity for 4-ft. 6-in. gage track, for shipment to New Zealand. The J. G. White Engineering Co., 43 Exchange Place, New York, is in the market for a 10-ton hand power crane for a client at Bowling Green, Ky. The Duquesne Light Co., 435 Sixth Avenue, Pittsburgh, has inquired for a 100-ton crane. R. B. Patch, 605 East Wilson Street, Streator, Ill., is reported in the market for a 10-ton, used electric overhead crane.

There has been but little crane business in the Pittsburgh district, but there is a general belief that by the early part of next year a good many orders will be before the trade. Steel Corporation subsidiaries have asked for appropriations for a number of cranes for Pittsburgh district plants, but it is not believed the funds will be authorized for expenditure this year. The Union Metal Products Co., Chicago, is inquiring for a 15-ton, 71-ft. 5½-in. span, 3-motor overhead crane.

Among recent purchases are:

Public Service Production Co., Newark, N. J., two 25-ton,

The City Council, De Land, Fla., will vote bonds Nov. 28 for \$465,000 for extensions and improvements in the municipal electric light plant and waterworks system, including the installation of new equipment.

St. Louis

ST. LOUIS, Nov. 3.

EARL HAWKINS & CO., 400 McDaniel Building, Springfield, Mo., will proceed with the construction of a one-story and basement, automobile service, repair and garage building, 112 x 120 ft., estimated to cost \$50,000 with equipment.

Cosden & Co., Inc., Tulsa, Okla., is reported to have plans for extensions in its oil storage and distributing works, including the installation of additional equipment. The property was recently acquired from the Taxman Refining Co., Kansas City, Mo., for about \$1,000,000.

The Tulsa Oxygen Co., First National Bank Building, Tulsa, Okla., has awarded a general contract to J. R. Brunsdie, 315 South Frankfort Street, for a one-story plant, 54 x 80 ft., at 1629 South Santa Fe Avenue.

The Common Council, Idabel, Okla., is planning for the installation of new filtration and pumping equipment, in connection with waterworks system, estimated to cost \$45,000, for which bonds will be voted. V. V. Long & Co., 1890 Colcord Building, Oklahoma City, Okla., is engineer.

The City Council, Braman, Okla., will install a new waterworks system, including tank, tower, pumping equipment, etc., for which bonds have been voted. F. B. King, Grain Exchange, Oklahoma City, Okla., is engineer.

Indiana

INDIANAPOLIS, Nov. 3.

MANUAL training equipment will be installed in the new two-story and basement high school to be erected at Hammond, Ind., for which bids are being asked. Plans were prepared by Berry Wainwright & Co., Hammond, architects.

The Calumet Engineering Co., 716 Hohman Street, Hammond, Ind., is arranging a call for bids for boiler and pumping equipment, for its East Chicago works, now in course of construction, estimated to cost \$30,000, for which Roy Clark, 4055 Grand Avenue, Indiana Harbor, Ind., has the building contract.

The National Veneer & Lumber Co., Indianapolis, Ind., will begin the erection of its new plant for which considerable equipment will be required.

The White River Packing Co., Muncie, Ind., has ten-

60-ft. boom locomotive cranes, from the McMyler Interstate Co.

Northern New York Utilities Co., Watertown, N. Y., a 45-ton power house crane, from the Northern Engineering Works.

American Smelting & Refining Co., a 15-ton, 40-ft. span hand power crane for shipment to Mexico, from the Whiting Corporation.

Erie Railroad, New York, a 4-motor walking jib crane for Susquehanna, Pa., from the Whiting Corporation.

Southern Railway, Washington, a 12½-ton, 38-ft. span, 2-motor, overhead crane, from a mid-western builder.

West Virginia Pulp & Paper Co., 200 Fifth Avenue, New York, a 2½-ton hand power crane from Maris Brothers.

A. Guthrie & Co., Inc., St. Paul, Minn., a 15-ton, gasoline driven locomotive crane on railroad trucks, from the American Hoist & Derrick Co.

New York, New Haven & Hartford Railroad, three reported to have been closed but not yet confirmed.

Erie Railroad, New York, a 25-ton stationary gantry crane with 5-ton auxiliary, for Newark freight yards, reported closed but not yet confirmed.

Baltimore & Ohio Railroad, Baltimore, Md., a 12½-ton overhead crane for Staten Island, New York, reported closed with Baltimore builder.

Guarantee Construction Co., 140 Cedar Street, New York, a 20-ton, 8-wheel locomotive crane for export to Cuba, from the Brown Hoisting Machinery Co.

American Steel & Wire Co., for New Haven, Conn., a 10-ton, 4-wheel locomotive crane from the Brown Hoisting Machinery Co.

tative plans for the erection of a one-story works, to replace a structure destroyed by fire, estimated to cost \$100,000. C. G. Gilmore, is president.

Frank B. Hunter, 912 State Life Building, Indianapolis, Ind., architect, has revised plans for a one-story automobile service, repair and garage building, 65 x 116 ft., estimated to cost \$125,000.

Cincinnati

CINCINNATI, Nov. 3.

MANUFACTURERS continue to report improvement in the machine tool industry. One of the largest purchases of recent months was made last week by a representative of a Japanese automotive parts manufacturer, involving complete equipment for a large plant in Japan. Orders placed with manufacturers in this district include milling machines, radial and upright drilling machines, planing machines and engine lathes. The company is continuing its purchases in other sections of the country. The White Motor Co. has about completed its purchases of equipment on its recent list, but is understood to be preparing another list to be issued shortly. Export business to Russia is said to be developing, some machines having been contracted for, with others on inquiry. Dealers report October as the best month this year and with the election out of the way, they, as well as manufacturers, are looking for a great improvement in orders.

Some business has been placed by implement manufacturers, particularly the International Harvester Co., which is buying for various plants. The Standard Sanitary Mfg. Co., Louisville, Ky., which last week closed for \$40,000 worth of polishing machines, is expected to take action this week on its inquiry for turret lathes. A number of inquiries are current from Canadian dealers, some for shipment to Europe, and it is reported that German manufacturers are seeking tools in this country, but have not issued inquiries as yet.

The American Laundry Machinery Co., Cincinnati, will at once rebuild the shipping and stock rooms of the Rochester plant, destroyed by fire Oct. 27 with a loss of \$500,000. E. B. Stanley is vice-president.

The Ohio River Gravel Co., Wheeling, W. Va., will soon commence the erection of a distributing plant at Marietta, Ohio, the company having made application for a permit.

It is expected that work will shortly begin on the erection of a new roundhouse at Chinnville, Ky., for the Chesapeake

& Ohio Railroad. Grading the land has begun, and a contract for the building is expected to be let in the immediate future.

The Indiana Hardwood Flooring Co., New York, with plants in New York State and Michigan, has purchased the flooring mill of the Yellow Poplar Lumber Co., Coal Grove, Ohio, and plans are being completed for additional woodworking machinery to increase the output. D. W. Von Bremen heads the company.

D. W. Salyer and K. E. Davis, Whitesburg, Ky., are planning the installation of machinery and power equipment, hoisting and conveying apparatus, etc., in connection with the operation of manganese properties in Bland County, Va.

The City Commissioners, Owensboro, Ky., plan extensions and improvements in the municipal electric works, with the installation of boiler, stoker and other equipment to cost approximately \$35,000.

The city of Greenville, Ohio, has awarded a general contract to the Bowyer Construction Co., Newcastle, Ind., for the construction of a filtration plant, estimated to cost \$165,000. The J. N. Chester Co., Union Bank Building, Pittsburgh, Pa., is engineer.

The Miller Keyless Lock Co., Kent, Ohio, has tentative plans for an addition to its factory. J. B. Miller is president.

Manual training equipment will be installed in the proposed high school to be erected by the Board of Education, Hubbard, Ohio, for which Richard A. Zenk, 144 West Wood Street, Youngstown, is preparing plans. It will cost \$300,000 including equipment. Evan E. Evans is president of the board.

H. P. Jacobs & Co., Independent Life Building, Nashville, Tenn., have been awarded contract for a two-story automobile service and repair building, for the G. Cole Motor Co., Ninth Avenue, Nashville, estimated to cost \$90,000 including equipment.

The Common Council, Mount Pleasant, Tenn., plans the installation of centrifugal pumping equipment in connection with a sewage works and disposal system, estimated to cost \$50,000.

South Atlantic States

BALTIMORE, Nov. 3.

THE Summers Fertilizer Co., Stock Exchange Building, Baltimore, has acquired the former plant of the Hubbard Fertilizer Co., Canton, Ga., and will make extensions and install additional equipment.

The General Purchasing Officer, Panama Canal, Washington, will take bids until Nov. 25 for cable, valves, pipe fittings, wires, siphons, dies, band saws, steel drums, insulation, resistance units, brackets, extension bells, battery jars, emery cloth, rubber packing, and other miscellaneous equipment, circular S-1638.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until Nov. 18, for a quantity of wire rope, for various navy yards, schedule 2845.

Manual training equipment will be installed in the two-story and basement high school, to be erected by the Baltimore County Board of Education, at Catonsville, Md., for which a building contract has been awarded to the Northeastern Construction Co., Lexington Building, Baltimore, estimated to cost \$330,000. Smith & May, Calvert Building, Baltimore, are architects. Samuel M. Shoemaker, Towson, is president of the board.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, has plans for a one-story automatic power substation at Old York Road, and Thirty-fifth Street, on site recently acquired.

The Commissioners, District of Columbia, Washington, will take bids Nov. 19 for a quantity of wire and cable, as per specifications on file.

The Victoria Lumber Co., Ltd., Shreveport, La., has inquiries out for a water tank and tower, 50,000-gal. capacity.

The Board of Trustees, Greenwood, S. C., plans the installation of manual training equipment in the new high school, for which preliminary plans have been prepared, estimated to cost \$200,000.

The Shreveport Railways Co., Shreveport, La., will begin the erection of its one-story machine and car repair shop, 190 x 230 ft., estimated to cost \$75,000, for which a building contract has been awarded to Glassell & Wilson, Shreveport.

The Norfolk & Western Railway Co., Roanoke, Va., has inquiries out for one double head axle lathe, and one 40-in. car wheel boring machine.

Bids will be received until Nov. 15, by the United States Engineer, Savannah, Ga., for one 20-in. dredging pump.

Chicago

CHICAGO, Nov. 3.

THE Ajax Motors Co., Racine, Wis., has placed orders for approximately \$150,000 worth of cylinder block equipment, including continuous-type milling machines, cylinder boring machines and heavy duty drills. It is now buying crank shaft machinery and later on will place orders for standard tools. This is the outstanding business of an otherwise quiet week. With the election so close at hand, most prospective purchasers have decided to delay their orders until the results are known. The Illinois Merchants Bank, Chicago, however, has closed for \$7,500 worth of tool-room equipment. The Union Metal Products Co., Chicago, is in the market for 10 single and double-end punches and shears.

Hoeft & Co., manufacturers of metal poultry supplies, now at 400 North Ashland Avenue, Chicago, have purchased the plant formerly occupied by the Brown Portable Elevator Co. at North Chicago. This property was owned by the Standard Conveyor Co., St. Paul, Minn., which took over the effects of the Brown Portable company more than a year ago. The new purchasers have started remodeling the building and it will be ready for occupancy soon.

The National Malleable & Steel Castings Co. is constructing an annealing building, 100 x 500 ft., at its plant at Indianapolis, Ind. Work on the structure, which will cost \$125,000, commenced Aug. 1, and will be ready for occupancy by Jan. 1.

The Hart-Parr Co., Charles City, Iowa, has closed a five-year contract with the Newport Boiler Co., Chicago, for the manufacture of the latter company's automatic magazine feed type of boiler. The Hart-Parr plant will be equipped to handle the new work.

The trustees of the Central Mfg. District, Chicago, will erect a two-story plant, 285 x 306 ft., for the American Bolt Corporation on the south side of West Forty-seventh Street near South Turner Avenue. The cost will be \$230,000. The American Bolt Corporation is now located at 1732 North Kolmar Avenue.

The trustees of the Central Mfg. District, Chicago, are having plans drawn for a one story plant for the Illinois Shipping Container Co., on the north side of Pershing Road, east of the P. A. Starck Piano Co. plant. The present location of the Illinois Shipping Container Co. is at 1302 West Division Street.

Improvements now under way at the plant of the Commonwealth Steel Co., Granite City, Ill., include enlargement of the foundry, together with the construction of a new open hearth furnace and the building of a new finishing department, 150 ft. long.

Mechanical coal-handling and other equipment will be installed in connection with the new two-story and basement plant, 63 x 154 ft., to be erected by the Hubbard Ice & Coal Co., 700 North First Street, Cedar Rapids, Iowa, estimated to cost \$45,000 exclusive of equipment.

The Atwood Stewart Vacuum Machine Co., 4527 Ravenswood Avenue, Chicago, contemplates the erection of an addition to its plant to cost \$35,000, exclusive of machinery.

Toy Tinkers, Inc., Evanston, Ill., manufacturer of mechanical toys, has tentative plans for a three-story and basement factory, estimated to cost \$125,000 with equipment. C. H. Pajean, 721 Custer Avenue, is secretary.

The Joliet Wrought Washer Co., Box 240, Joliet, Ill., manufacturer of metal stampings, washers, etc., is considering plans for rebuilding the portions of its works destroyed by fire Oct. 22, with reported loss of \$100,000 including machinery.

The Victor Adding Machine Co., 319 North Albany Avenue, Chicago, has acquired 100,000 sq. ft. on Rockwell Street south of Irving Park Boulevard and will begin work at once on the construction of a three-story plant, 260 ft. long, to cost \$250,000. This will be the first unit of a \$500,000 plant contemplated by the company.

The Joseph E. Smyth Co., manufacturer of bookbinder's machinery, 638 Federal Street, Chicago, has purchased the northwest corner of Park and Campbell Streets and will erect a two-story plant.

Mundie & Jensen, 39 South La Salle Street, Chicago, have prepared plans for a one-story forge shop, 128 x 140 ft., at Keeler and Fullerton Avenues, for the Charles C. Larson Co.

Melvin A. Nelson, 1720 North California Avenue, Chicago, has prepared plans for a one-story factory, 95 x 95 ft., on North Crawford Avenue, for the Binko Tool Mfg. Co. to cost \$30,000.

The Commonwealth Edison Co., 72 West Adams Street, Chicago, has let contract for a one-story substation, 30 x 50 ft., at 10827 Avenue F, to cost \$9,200.

The Chicago Bearing Metal Co., 2230-58 West Forty-third Street, Chicago, has awarded contract for a one-story addition, 66 x 100 ft., to cost \$11,000.

The Union Metal Products Co., Chicago, is inquiring for two 2500-lb. steam hammers and a motor-driven plate shear to cut $\frac{3}{8}$ -in. plate, up to 144 in. wide.

Pittsburgh

PITTSBURGH, Nov. 3.

LAST week was quiet in the machine tool trade, and with the end of the year approaching it is the general opinion that the next 60 days will not be productive of much more than ordinary replacement needs. A better inquiry is looked for, however, in connection with 1925 programs. The tools which the Central Tube Co., Economy, Pa., has asked bids on, will probably be placed soon. No other lists of importance are before the trade.

Builders of rolling mills have found business slow lately, but are reasonably busy on old orders. There is some complaint among manufacturers of electrical equipment over the long gaps between orders.

Fire, Oct. 27, destroyed the two-story crushing plant of the Duquesne Slag Products Co., Diamond Bank Building, Pittsburgh, Pa., located at Temple, Pa., with loss of \$30,000 including equipment.

The Pittsburgh Railway Co., 435 Sixth Avenue, Pittsburgh, has plans for a one-story machine and car repair shop, 156 x 231 ft.

The Laurel Coal Mining Co., Weston Road, Midway, W. Va., has tentative plans for the rebuilding of its power house destroyed by fire Oct. 24, with considerable loss to machinery.

The Hatfield Reliance Coal Co., Huntington, W. Va., has work in progress on a new coal tipple and pier to cost \$100,000, including equipment.

E. H. Morford & Co., Charleston, W. Va., have inquiries out for one steam shovel, crawler type, $\frac{3}{4}$ to 1-yd. capacity, and one air compressor.

The Guyan Machine Shops, Inc., Logan, W. Va., machinery dealer, is in the market for one slip ring motor, three phase, 60-cycle, 220 volts, and one 100 hp. a.c. motor, three phase, 60 cycle, to drive generator at 600 r.p.m.

Pacific Coast

SAN FRANCISCO, Oct. 29.

THE Silverton Blow Pipe Co., Silverton, Ore., will soon call for bids for the erection of its new factory, 100 x 135 ft., warehouse building 50 x 80 ft., and foundry department, 60 x 72 ft.

The City Council, J. S. Loobourrow, clerk, El Centro, Cal., will receive bids until Nov. 19 for two electric motor driven centrifugal pumping units; one vertical electrical pump, complete, and switchboard apparatus.

C. A. Miller and E. F. Gilbert, 407 Merritt Building, Los Angeles, have awarded contract to Trewhitt & Shields, Western Mutual Life Building, for a nine-story and basement automobile service, repair and garage building at Sixth and Carondelet Streets, 100 x 124 ft., and estimated to cost \$400,000.

The Ulmer Mfg. Co., Santa Ann, Cal., manufacturer of mechanical specialties, will proceed with its new plant on Delhi Road, for which contract has been awarded to the Union Iron Works. It will comprise a main building, 90 x 150 ft., one-story foundry and one-story machine shop.

The Southern California Gas Co., Riverside, Cal., is arranging an appropriation of \$2,250,000 for proposed extensions in its system, and the installation of additional equipment.

The Laher Auto Spring Co., 167 Hayes Street, San Francisco, has plans for the first unit of its proposed factory, at Oakland, Cal., estimated to cost \$55,000 with equipment.

The Western Waxed Paper Co., Oakland, Cal., will erect a new factory at East Sixty-first Street, Los Angeles, 120 x 150 ft., estimated to cost \$40,000 exclusive of equipment.

Canada

TORONTO, Nov. 3.

NOTWITHSTANDING that the demand for machine tools in this market has been confined largely to single orders, sales for October show a slight increase over those of the previous month. With regard to the future, dealers and builders are strongly of the opinion that there is still much room for improvement and predictions are freely made that a good demand for tools will continue for some time. Orders for small tools show little change. The automotive industry is the principal buyer of these commodities, but manufacturing concerns in general are continually entering the market for some line.

The McNamara Motor Wheels, Ltd., St. Mary's, Ont., recently incorporated with a capital stock of \$300,000, is establishing a plant, and is in the market for equipment. The provisional directors of the company include Russell E. McNamara, executive director; Berton E. Seymour, financial director; W. A. McNeill, president; Glen W. Slater, secretary-treasurer.

R. B. Braid, secretary Essex Border Utilities Commission; Heintzman Building, Windsor, Ont., is inquiring for the following equipment in connection with waterworks pumping station: Construction of pumping station; pumping equipment; switchboard equipment; valves; venturi meters; automatic float regulator; traveling screens; traveling hand operated crane; cast iron pipes; alum feed machine; chlorinators; electric wiring and power connections. J. Clark Keith is chief engineer of the commission.

The Spar Mining & Milling Co., Toronto, is having plans prepared for the erection of a mill at Lakefield, Ont., for milling non-metallic minerals. F. Robertson is engineer.

T. Pringle & Sons, Ltd., Montreal, is preparing plans for an addition to the mills of the Wayagamack Pulp & Paper Co., Ltd., at Three Rivers, Que., to cost \$2,000,000.

S. Dinamore & Co., Universal Building, Windsor, Ont., have the general contract for an addition to the plant of the Auto Specialties Co., to cost \$15,000.

Shawville, Que., will rebuild the municipal electric plant recently destroyed by fire with a loss of \$15,000. E. T. Hodgins is secretary.

J. J. Fitzpatrick, 127 Church Street, Sault Ste. Marie, Ont., will call for bids on several trades in connection with Government airdrome and machine shop to be erected at Sault Ste. Marie. Equipment for the machine shop has not yet been purchased.

Industrial Notes

The Springfield Body Corporation, Springfield, Mass., maker of automobile bodies, has purchased the Stevens-Duryea Motors, Inc. plant at Meadow Street and Ducharme Avenue, Williamstown, consisting of 34 acres of land and manufacturing units. The new owners will use the plant for the construction of taxicab and bus bodies, while the manufacture of passenger car and truck bodies will continue in the company's old works. Stevens-Duryea Motors, Inc., will continue operations in the Rauch-Lang plant.

The B. Mercil & Sons Plating Co., 1907-19 Fulton Street, Chicago, will complete a plant addition in early November, which will give the company about 25,000 sq. ft. of floor area. Sand blasting equipment will be installed and automatic plating equipment, in addition to present facilities for nickel, brass and copper plating and black oxidizing.

Earnings of Companies

The United States Cast Iron Pipe & Foundry Co. has declared an extra dividend of $\frac{1}{2}$ of 1 per cent on preferred stock in addition to an extra dividend of the same amount previously declared on preferred shares. Payment of the latter dividend, declared No. 16, was restrained by the Court of Chancery of the State of New Jersey, and now has been authorized by the Court of Errors and Appeals.

Net earnings of the Republic Steel Co. and subsidiaries, including the Warren Pipe & Foundry Co., for the third quarter amounted to \$262,420, after depreciation, interest and Federal taxes. Earnings for the first nine months were \$399,954. The balance sheet as of Sept. 30 shows current assets of \$4,600,000 against current liabilities of \$744,000, leaving net working capital of \$3,856,000.

The Eaton Axle & Spring Co. reports a deficit for the

third quarter, after charges, of \$35,153. This compares with a net income of \$125,358 in the preceding quarter. The net income for the nine months ended Sept. 30 was \$212,308.

Net earnings of the Savage Arms Co. for the third quarter amounted to \$163,181 after taxes, depreciation, etc., compared with \$383,968 in the preceding quarter and \$177,582 in the third quarter of 1923.

The Universal Pipe & Radiator Co. for the third quarter reports a net income of \$194,590 after charges, but before Federal taxes. Net income for the first nine months of 1924 totaled \$738,225, before Federal taxes. Surplus at the end of the nine months amounted to \$581,934.

The Iron Products Corporation reports net income for the third quarter of \$228,472 after depreciation, depletion, etc., equivalent after preferred dividends to \$1.48 a share on outstanding common stock. The net income for the nine months of the current year totals \$875,320. Surplus for the nine months ended Sept. 30 was \$604,813.

Fairbanks, Morse & Co. show a net income of \$1,384,517 after Federal taxes, etc., for the nine months ended Sept. 30.

Net income of the Central Steel Co. for the third quarter was \$636,765. Net income for the nine months totaled \$2,652,372.

Net income of the Inland Steel Corporation for the nine months ended Sept. 30, totaled \$4,599,748, equivalent to \$3.44 a share on common stock, against \$3,731,356 in the same period of 1923. The company declared its regular quarterly dividend on common stock.

Net sales of the Superior Steel Corporation for the three months ended Sept. 30, were \$914,176. Manufacturing costs and selling expenses are figured at \$914,250, leaving an operating loss of \$74. From other sources an income of \$21,756 was derived. Interest, amortization, reserves for taxes and miscellaneous charges aggregated \$210,586. After paying \$225,000 in dividends, the company had a deficit of \$82,292, thereby bringing the profit and loss surplus down to \$720,718.

Plans of New Companies

Shortly after the Michigan Co., 1600 Davison Avenue East, Detroit, was organized as successor to the Michigan Truck & Lumber Co., the truck factory in Holly, together with all machinery and equipment, was completely destroyed by fire. Future plans have not been determined.

The Haines Automatic Switch & Signal Co., Carmel, Ind., has been organized with \$10,000 capital stock to manufacture automatic street signals. A portion of the product will be manufactured outside of the company's plant, which will be used mainly for assembling. Leslie Haines is president.

The J. H. France Refractories Co., Snow Shoe, Pa., recently incorporated with \$300,000 capital stock, has taken over the fire brick plant formerly owned by the Snow Shoe Fire Brick Co. Fire bricks for furnace and steel mill use will be manufactured.

The John H. Murphy Iron Works, recently incorporated, will continue the business of John H. Murphy as manufacturing and contracting engineer. The company has a large boiler works and machine shop in operation.

The Greenville Steel & Foundry Co. is now operating the establishment of the Greenville Iron Works, Greenville, S. C., which has liquidated. W. C. Cleveland is one of the heads.

The Hodge Mfg. Corporation, 56 Broad Street, Bloomfield, N. J., has been incorporated with \$25,000 capital stock and is now engaged in manufacturing tools and mechanical specialties.

The Black Palm Fishing Rod Co., 109 Washington Avenue, West Haven, Conn., recently organized to operate as indicated, expects eventually to build a new plant, although steps will not be taken immediately. Charles J. Baylis is secretary-treasurer.

The Apex Foundry Co., 170 Mt. Elliott Avenue, Detroit, incorporated with capital stock of \$10,000, will continue to operate the foundry which has been run under the direction of George R. Couls and Ray Scott, as a jobbing foundry, making semi-steel and gray-iron castings. Harry L. Pierson is secretary-treasurer.

The Harter Rolled Metals Co., Goshen, Ind., has been incorporated with \$75,000 capital stock and will operate rolling mills and manufacture all kinds of tubings. E. C. Harter is president; E. C. Crow, vice-president, and V. G. Cawley, secretary.

H. P. Wilson has withdrawn from H. P. Wilson & Co. and organized the Wilson Machinery Co., located at 1526 Sixteenth Street, Sugar Building, Denver. The new company will act as distributor of C. L. Best tractors and road-building machinery. Mr. Wilson expects to add possibly four other related lines.

The National Lead Battery Co. has been organized with \$150,000 capital stock to manufacture electric batteries and parts. Plans are incomplete as yet. Address care of Corporation Trust Co. of America, du Pont Building, Wilmington, Del.

The Electrice Corporation, 120 Broadway, New York, has been incorporated with \$1,000,000 capital stock, to manufacture electric refrigerators, which are operated by a 1/6 hp. motor. The company has a moderate-sized plant which may be used to produce a part of the output. It is planned to establish distributing centers throughout the country, but final plans for operation will not be determined for about two weeks. It appears likely that part of the work may be done by contract. C. J. Cass, R. McCormick and M. P. Datels are the incorporators.

The Radio Institute, Inc., care of Prentice Hall, Inc., 70 Fifth Avenue, New York, has been incorporated with \$300,000 capital stock, to manufacture radio equipment and devices. Plans for operation are not yet available.

The Zinn Corporation has been organized to manufacture brass and other metal products. It is successor to the Compact Box department of Simon Zinn, Inc., manufacturer of fancy metal goods, Zinn Building, New York. Headquarters of the new company will be located in Bristol, Conn. More definite plans will be given in a later issue.

The Marsten Steel Co., 207 Orange Street, New Haven, Conn., has been organized with Phillip Sellers as president; Joseph M. Rice, Jr., secretary, and William E. Prindle, treasurer, to manufacture steel products and similar lines.

The Beirne Six-Wheel Motor Coach Co., New York, organized with \$100,000 capital stock, plans to manufacture motor buses, parts, etc. The company is about ready to go into production, manufacturing being done by contract. J. W. Collopy, Jr., 2 Rector Street, is representative.

The A. J. Soden Co., 322 Pearl Street, New York, has been organized to act as eastern agent for steel products, such as drill rods, files, graving tools, pliers, hack saws, etc., made by the Peter Stubs interests of Great Britain.

The A. W. Millhauser Corporation, 25 Broadway, New York, recently incorporated, will act as dealer in non-ferrous metals. A. W. Millhauser is president.

The Binder-Gould Corporation, 685 Canfield Avenue West, Detroit, capitalized for \$30,000, has taken over a business established for four years in the manufacture of automotive specialties. A. E. Binder is president and W. E. Gould, secretary-treasurer.

The Owens Universal Joint & Gear Co., Inc., Lake Worth, Fla., has been organized to manufacture Owens universal joints. It has not fully decided upon plans for manufacturing. D. P. Owens is president, Earl J. Reed, vice-president, and Truman A. Horton, secretary-treasurer.

The Heyler Motor Co. has been organized with capital stock of \$100,000 to manufacture automotive products and equipment. Plans are not available at this time. Address in care of Corporation Trust Co. of Delaware, Dover, Del.

The Bertsch Machinery Co., 70 Chestnut Street, Newark, N. J., has been organized to act as the distributor of machine and wood shop equipment, also to deal in used machine tools and factory equipment. Charles C. Bertsch heads the company.

The H. M. Bylesby Co., Chicago, has announced the organization of the Standard Power & Light Corporation, as the first step toward building a large public utility and electric power system. Properties to be acquired include important hydro-electric power sites, which are now under consideration. Capitalization of the new company consists of 100,000 shares of preferred stock, and 100,000 shares of common.

Colorado Fuel Deficit

With the third-quarter deficit of \$297,790, the earning record of the Colorado Fuel & Iron Co. since the war shows a net deficit before dividends of \$1,112,293 and a deficit after dividends of nearly \$3,500,000. This seems to point to the company's handicap due to the distance of its plants from the principal steel markets. Persons interested in the company's affairs are hopeful that the localization of competition since the abolition of "Pittsburgh plus" will operate to the company's benefit.

The Haynes Automobile Co., Kokomo, Ind., has been declared a bankrupt by United States District Judge A. B. Anderson. An involuntary petition was filed against the company on Sept. 2 by the Chicago Tool & Kit Co., the grinding wheel clearing house of Detroit, and H. Merrifield of Chicago. According to the schedule, assets were placed at \$1,684,322 and liabilities at \$3,619,258.

Tin Plate Manufacture in India

(Concluded from page 1198)

He therefore wants a fine quality and a good looking plate, and there is no doubt that an inferior quality of oil could be sold for a higher price simply because it has a better appearing can.

The result of the above fact is that, whereas the Tin Plate Co. of India, Ltd., could make a tin plate with a less coating of tin which would answer the original purpose of making an oil can and safely transporting petrol for use to some far distant point, they are still faced with the fact that they must have a good appearing can in order to meet the high second-hand value.

The factory report on rejections for the week ending Aug. 11, 1923, is interesting. While the total percentage of rejections for all reasons was only 0.62 per cent, 1064 sheets out of a total of 2276 sheets were rejected on account of "undersize." This was 46 per cent of the whole amount rejected and was due to poor slitting, and was corrected at once. The following table shows the individual figures of this report:

Rejections, Week Ending Aug. 11, 1923

Cause of Rejection	Number of Sheets		
	Sides	Ends	Total
Rusty	30	113	143
Buckled	744	183	927
Undersized	1,054	10	1,064
Thin	10	...	10
Thick	2	...	2
Damaged from wagon rivet heads	130	...	130
 Total rejections	 1,970	 306	 2,276
Boxes used:		Boxes	
18 $\frac{3}{4}$ " x 14"		1,971	
20 $\frac{1}{4}$ " x 10"		545	
 Total	 Rejections—0.62 per cent.	 2,516	

The idea of manufacturing tin plate in a climate such as in India was very severely censured, and by many it was considered to be an absolute impossibility. It may be said in all justice to everybody concerned, that the success of the plant up to date is primarily due to two things:

1. To the very careful study and forethought given to the layout, to the design of buildings, and to the type and arrangement of equipment provided. Also, to the special provisions for taking care of the comfort of the hot mill crew proper, consisting of hooded and cooled furnaces, large volumes of cooled air to the men, and tremendous areas of water-cooled floor plates per mill and per unit of heat.

2. To the untiring efforts of the works manager and the hot mill superintendent, who had to face not only the problem of teaching a native, who could not understand their language, how to do an extremely difficult job, but who also necessarily had several months of constant effort in connection with the proper adjustment of experienced Welsh tin workers to the particular type of mill and system of working required. These two men were most loyally supported by hearty co-operation from the heads of the various departments.

American Mills Might Profit from This Experience
in India

Without all of the special provisions, including the extreme size of buildings, it is safe to assume that there would probably have been three months during the year that the hot mills could not operate. The results show that the expenditure for all these features was warranted. We wish to point out in connection with this same fact that, were some of the same ideas carried out in the design of tin plate plants in our country, as well as in Wales, the result would be practically the same. In this country during the summer months there are always several days over different periods in many of the mills when the men cannot stand up to the work required of them, or else they will not report for duty and the mills must be shut down and production lost. These same mills properly designed

and equipped could be kept in continuous operation with entire comfort to the men, and the tonnages could be increased on many days.

In other words, a modification of these same ideas properly applied to the design of a new plant would certainly increase production over a year at least 10 per cent, and this increase in production, together with the additional comfort to the men when working, would more than pay for the interest on the extra investment. In South Wales, in the summer of 1923, there were two weeks during which practically all of the tin mills were idle on account of heat, and the majority of mills in that country are not comparable to the mills in the United States in regard to size of building, spacing of rolls and facilities for the comfort of the men when working.

Magnetism Made Audible

Magnetism is no longer a silent phenomenon. The thousands of visitors at the recent Progress Exposition at Schenectady, N. Y., were able to listen to a magnet affecting a piece of iron. The research laboratory of the General Electric Co. exhibited a device whereby a magnet, when brought near a piece of iron, caused a roaring noise to issue from a loud speaker.

Externally, no change is apparent when a piece of iron is magnetized. Scientists have held the theory that magnetism results from a change in the arrangement of the atoms within the iron. Thus a magnet causes all of the unit particles to face in the same direction. Soft iron quickly loses its magnetism when the magnet is removed from the vicinity; hard steel retains some, probably because the atoms have less tendency to resume their former chaotic arrangement. Steel can be made to lose its magnetism, however, by striking it several times, presumably because the blows tend to disarrange the particles.

The apparatus exhibited by the General Electric Co. carries out the idea of Dr. H. Barkhausen of Dresden, Germany. A piece of soft iron is inserted in a coil of 17,000 turns of 3-mil wire. The coil is attached to an amplification set, which in turn is connected either to head phones or to a loud speaker.

When a magnet is brought near the iron, a rustle is heard. If the approach is rapid, the noise is loud and abrupt; if slow, the sound is softer and lasts longer. While the magnet is being removed, a similar sound is heard. If the magnet is quickly removed and quickly brought back to its former position, only a little sound is heard. If brought still nearer the iron, there is more sound. If, after the magnet has been brought near the iron bar and the noise has subsided, the poles of the magnet are reversed, a very loud and abrupt noise is heard.

Scientists believe that the phenomenon results from the motion of the unit magnetic particles within the iron. Thus, when the magnet is brought near the iron, groups of the atoms turn around to face in the same direction. The stronger the magnetic influence, the larger the number of particles that turn around, the greater the effect, and the louder the noise. Similarly, when the magnet is removed, the atoms gradually become disarranged. When the magnet is quickly brought back to its original position, the noise is slight since only a few of the particles have become disarranged. When the polarity of the magnet is reversed, the particles turn around quickly, and thus the noise is much louder.

Shipments of mining and industrial electric locomotives in the quarter ended Sept. 30 are reported by the Department of Commerce at 148, valued at \$738,540. Reports are from nine firms, or practically the entire industry. The figures are somewhat smaller than those for the quarter ended June 30, when 155 units valued at \$868,672 were shipped. For the nine months of 1924 the total is 488 units, valued at \$2,581,808. For the 12 months of 1923 the figures were 1334 units, valued at \$6,221,170.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates		Per Lb.
Refined iron bars, base price.....		3.24c.
Swedish charcoal iron bars, base.....		6.75c. to 7.25c.
Soft steel bars, base price.....		3.24c.
Hoops, base price.....		4.49c.
Bands, base price.....		3.99c.
Beams and channels, angles and tees, 3 in. x 1/4 in. and larger, base.....		3.84c.
Channels, angles and tees under 3 in. x 1/4 in., base.....		3.24c.
Steel plates, 1/4 in. and heavier.....		3.84c.

Merchant Steel		Per Lb.
Tire, 1 1/2 x 1/2 in. and larger.....		3.20c.
(Smooth finish, 1 to 2 1/2 x 1/4 in. and larger).....		3.55c.
Toe-calk, 1/2 x 1/8 in. and larger.....		4.20c.
Cold-rolled strip, soft and quarter hard.....		7.00c.
Open-hearth spring steel.....		4.50c. to 7.00c.
Shafting and Screw Stock:		
Rounds.....		4.05c.
Square, flats and hex.....		4.55c.
Standard tool steel, base price.....		15.00c.
Extra tool steel.....		18.00c.
Special tool steel.....		23.00c.
High-speed steel, 18 per cent tungsten.....		70c.

Sheets		Per Lb.
Blue Annealed		Per Lb.
No. 10		3.89c.
No. 12		3.94c.
No. 14		3.99c.
No. 16		4.09c.

Box Annealed—Black		Blued Stove Pipe Sheet	Per Lb.
Soft Steel	C. R. One Pass		
C. R. One Pass	Per Lb.		
Nos. 18 to 20.....	4.30c. to 4.45c.	....	....
Nos. 22 and 24.....	4.45c. to 4.60c.	5.10c.	....
No. 26	4.50c. to 4.65c.	5.15c.	....
No. 28*	4.60c. to 4.75c.	5.25c.	....
No. 30	4.70c. to 4.95c.	....	....

Galvanized		Per Lb.
No. 14		4.70c. to 4.85c.
No. 16		4.85c. to 5.00c.
Nos. 18 and 20.....		5.00c. to 5.15c.
Nos. 22 and 24.....		5.15c. to 5.30c.
No. 26		5.30c. to 5.45c.
No. 28*		5.60c. to 5.75c.
No. 30		6.10c. to 6.25c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe

Standard Steel		Wrought Iron	Black Galv.	Black Galv.
Black Galv.	Galv.			
1/8 in. Butt...	—41 —24	1/8 in. Butt...	—4	+19
3/8 in. Butt...	—46 —32	3/8 in. Butt...	—11	+ 9
1-3 in. Butt..	—48 —34	1-1 1/2 in. Butt.	—14	+ 6
2 1/2-6 in. Lap..	—44 —30	2 in. Lap....	—5	+14
7-8 in. Lap...	—41 —11	2 1/2-6 in. Lap.	—9	+ 9
9-12 in. Lap...	—34 —6	7-12 in. Lap...	—3	+16

Bolts and Screws

Machine bolts, cut thread, 50 to 50 and 10 per cent off list

Carriage bolts, cut thread, 40 to 40, 10 and 10 per cent off list

Coach screws, 50 to 60 per cent off list

Wood screws, flat head iron, 75, 20, 10 and 10 per cent off list

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER		Per Lb.
Bright, basic		4.25c. to 4.50c.
Annealed soft		4.50c. to 4.75c.
Galvanized annealed		5.15c. to 5.40c.
Coppered basic		5.15c. to 5.40c.
Tinned soft Bessemer.....		6.15c. to 6.40c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire		BASE PRICE
High brass sheet		17 1/2c. to 18 1/2c.
High brass wire		17 1/2c. to 18 1/2c.
Brass rods		15 1/2c. to 16 1/2c.
Brass tube, brazed		25c. to 26 1/2c.
Brass tube, seamless		21 1/2c. to 22 1/2c.
Copper tube, seamless		23 c. to 24 c.

Copper Sheets

Sheet copper, hot rolled, 20%c. to 21 1/2c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates		Prime	Seconds
Bright Tin	Grade "AAA"	80 lb.. \$6.15	\$5.90
	Grade "A"	90 lb.. 6.30	6.05
	Charcoal	14x20 100 lb.. 6.45	6.20
	Charcoal	IC.. 6.65	6.40
	14x20	IX.. 7.85	7.60
	IXX.. 14.40	IXX.. 9.00	8.75
	IXXX.. 15.75	IXXX.. 10.35	10.10
	IXXXX.. 17.00	IXXXX.. 11.35	11.10

Terne Plates		8 lb. coating, 14 x 20	
100 lb.			\$7.00 to \$8.00
IC			7.25 to 8.25
IX			8.25 to 8.75
Fire door stock			9.00 to 10.00

Tin		
Straits, pig		55c.
Bar		60c. to 64c.
Copper		
Lake ingot		16 c.
Electrolytic		15 1/2c.
Casting		14 1/2c.

Spelter and Sheet Zinc		
Western Spelter		7 1/2c.
Sheet zinc, No. 9 base, casks		10.85c. open 11.60c.
Lead and Solder*		
American pig lead		9 1/2c. to 10 1/2c.
Bar lead		13c. to 15c.
Solder, 1/2 and 1/4 guaranteed		39c.
No. 1 solder		36c.
Refined solder		30 1/2c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal		
Best grade, per lb.		75c. to 90c.
Commercial grade, per lb.		35c. to 50c.
Grade D, per lb.		25c. to 35c.

Antimony		
Asiatic		14c. to 15c.
Aluminum		
No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.		36c.

Old Metals		
Business is active and values are firm. Dealers' buying prices are as follows:		
Cents Per Lb.		
Copper, heavy crucible		11.50
Copper, heavy wire		10.75
Copper, light bottoms		9.25
Brass, heavy		7.00
Brass, light		5.50
Heavy machine composition		8.25
No. 1 yellow brass turnings		7.50
No. 1 red brass or composition turnings		7.75
Lead, heavy		7.50
Lead, tea		5.50
Zinc		3.75
Cast aluminum		16.00
Sheet aluminum		16.00